

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-8056M40C-A

Representative (Tested) Model: LED-8056M40C-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.

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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<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	N/A	
Model Number	LED-8056M40C-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	4000K	
LED Manufacturer	SAMSUNG ELECTRONICS CO., LTD	
LED Model	SPMWH1228FD5WAT0SE	
Sample Number	GZE1801030-H-U1	
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	<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.

2.1 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction QD25)

Test date	2018-05-02	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8056M40C-A		

Electrical Measurement:

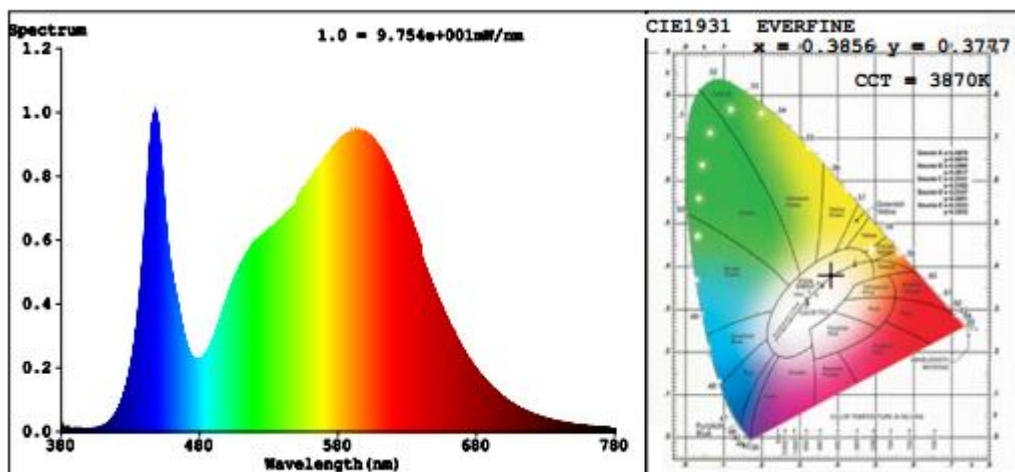
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180103	277.0	60	0.1642	43.56	0.9576	13.52
0-H-U1	347.0	60	0.1383	43.68	0.9102	16.35

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	79	R9	0
Frequency (Hz)	60	R2	87	R10	71
CCT (K)	3870	R3	94	R11	80
Duv	-0.0010	R4	80	R12	63
Chromaticity (x, y)	x=0.3856 y=0.3777	R5	80	R13	81
Chromaticity (u', v')	u'=0.2281 v'=0.5028	R6	83	R14	97
Color Rendering Index (CRI)	81.1	R7	84	R15	73
R9	0	R8	61	--	--

Photometric Measurement – Goniophotometer Method:

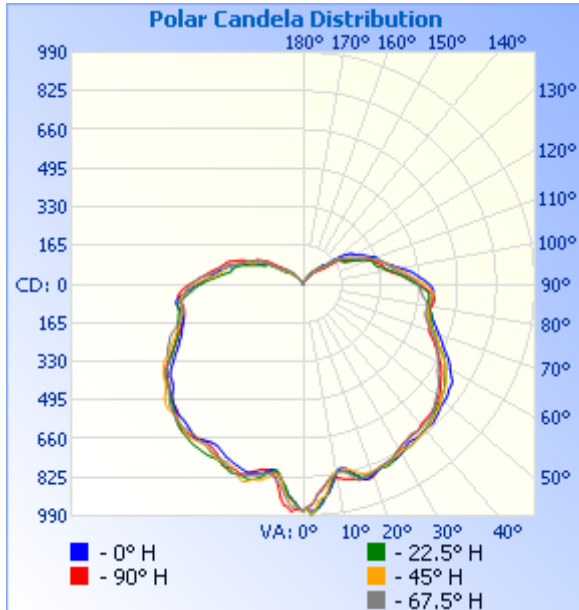
Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	5500.8	5504.1
Luminous Efficacy (lm/W)	126.28	126.01
Most worst Luminous/Highest Watts	125.93	
Beam Angle (°)	181.2	--
Center Beam Candle Power (cd)	966	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	707.2	12.9%
0-40	1,213.5	22.1%
0-60	2,459.2	44.7%
60-90	1,771.3	32.2%
70-100	1,609.3	29.3%
90-120	1,047.2	19%
0-90	4,230.5	76.9%
90-180	1,270.4	23.1%
0-180	5,500.9	100%

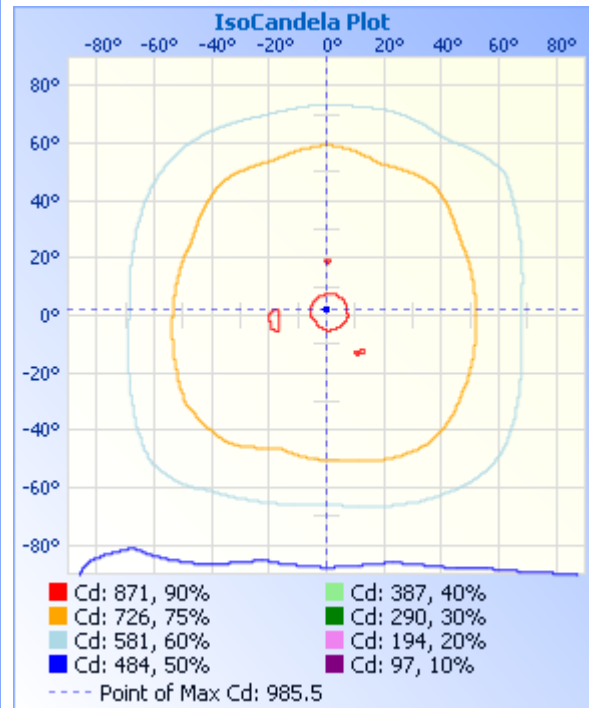
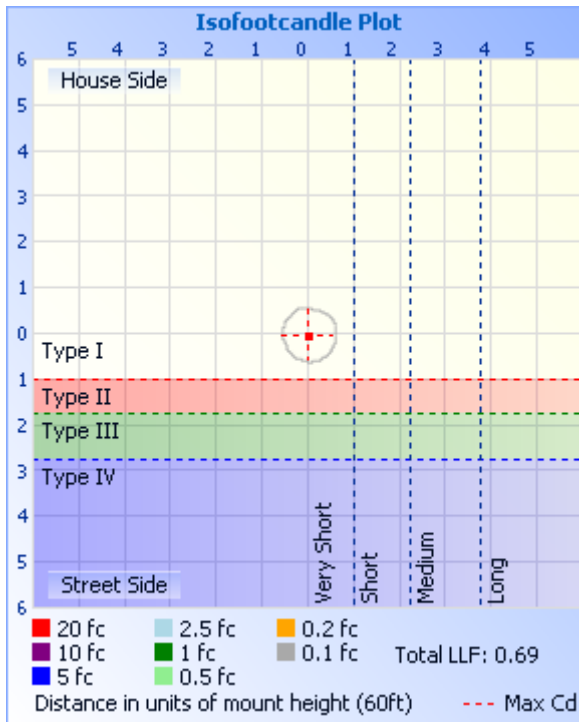
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	83.0	1.5%	90-100	459.6	8.4%
10-20	239.2	4.3%	100-110	348.6	6.3%
20-30	385.1	7.0%	110-120	239.0	4.3%
30-40	506.3	9.2%	120-130	135.1	2.5%
40-50	602.8	11.0%	130-140	61.0	1.1%
50-60	642.9	11.7%	140-150	21.6	0.4%
60-70	621.6	11.3%	150-160	4.6	0.1%
70-80	584.2	10.6%	160-170	0.8	0%
80-90	565.5	10.3%	170-180	0.1	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width
10.0ft	9.66 fc	
20.0ft	2.42 fc	
30.0ft	1.07 fc	
40.0ft	0.60 fc	
50.0ft	0.39 fc	
60.0ft	0.27 fc	



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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	966	966	966	966	966	966	966	966	966	966	966	966	966	966	966	966	966
1	961	963	963	952	954	962	962	961	957	959	960	959	965	961	961	961	961
2	970	986	982	950	942	952	951	940	934	939	946	950	962	952	949	956	970
3	967	973	968	930	927	922	929	910	923	916	931	953	973	961	949	950	967
4	958	953	928	900	896	897	899	892	905	902	918	933	954	964	959	960	958
5	942	927	916	891	881	857	853	857	874	867	893	904	946	937	954	957	942
6	914	915	911	872	866	821	834	820	852	845	854	876	919	907	942	936	914
7	900	889	880	847	852	806	825	810	832	819	825	857	870	874	903	921	900
8	873	858	834	834	842	812	815	814	808	802	817	843	836	848	867	880	873
9	848	844	817	834	840	820	811	828	801	807	827	829	818	824	833	842	848
10	819	815	818	817	840	823	818	841	805	818	832	822	810	809	814	824	819
11	804	812	817	814	845	832	825	850	815	826	844	821	806	797	805	805	804
12	804	815	808	818	851	845	835	857	825	838	856	825	809	791	809	804	804
13	808	823	810	825	853	851	849	861	828	850	859	835	813	791	818	807	808
14	822	831	816	841	859	856	861	867	830	859	860	840	823	793	819	813	822
15	837	844	827	862	863	866	867	866	836	863	866	844	828	804	826	824	837
16	852	858	837	872	868	870	866	862	838	866	876	849	838	806	832	837	852
17	865	862	846	867	873	870	862	858	837	863	882	854	851	808	836	845	865
18	875	863	851	863	877	870	861	852	834	859	874	857	853	818	842	850	875
19	876	866	853	860	877	871	862	842	829	857	860	862	851	824	850	858	876
20	870	863	852	859	874	870	861	829	825	861	849	859	842	826	855	870	870
21	863	856	851	855	864	870	860	819	821	862	837	852	842	822	849	866	863
22	858	852	850	851	854	868	857	814	816	857	831	842	847	825	840	860	858
23	853	852	849	847	847	858	852	815	812	850	826	836	849	828	836	842	853
24	849	856	849	844	845	851	849	816	808	842	827	830	847	827	827	828	849
25	844	857	847	841	843	848	844	810	800	837	831	824	836	820	823	817	844
26	843	854	843	837	842	848	836	806	793	835	832	822	824	812	824	812	843
27	845	847	837	834	836	851	833	802	787	833	829	821	812	796	822	811	845
28	846	840	835	829	829	853	831	798	783	836	825	819	805	784	818	807	846

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29	842	837	834	820	823	854	827	794	781	837	818	814	800	779	815	805	842
30	837	834	829	813	819	854	827	790	781	836	811	806	794	780	809	803	837
31	830	831	827	808	813	853	826	784	783	835	807	803	791	782	808	797	830
32	823	830	828	804	806	848	824	777	788	833	805	800	791	787	807	794	823
33	816	830	829	801	803	845	820	773	794	832	807	799	792	789	805	788	816
34	812	827	827	797	800	843	816	771	802	831	809	798	796	791	803	785	812
35	813	824	824	792	798	839	811	769	804	829	811	795	802	795	802	784	813
36	816	822	822	789	796	836	809	769	798	826	812	793	804	796	804	786	816
37	816	819	820	792	797	834	804	770	792	822	813	794	805	797	812	791	816
38	814	816	817	794	795	831	796	772	786	819	812	795	806	796	816	795	814
39	813	812	816	794	791	828	789	774	781	816	807	796	810	796	812	795	813
40	812	809	813	793	785	824	783	774	777	812	801	797	809	793	807	797	812
41	812	805	810	791	781	819	775	773	773	808	795	798	805	791	807	801	812
42	813	803	807	790	780	814	773	767	771	801	789	796	796	787	803	803	813
43	813	799	804	787	779	811	772	762	772	794	784	793	786	783	792	802	813
44	808	794	796	784	777	806	772	757	768	786	783	787	778	780	786	801	808
45	802	790	793	780	775	802	772	749	763	779	783	782	769	777	780	797	802
46	799	782	790	773	772	796	771	741	758	771	785	776	762	772	774	792	799
47	793	779	788	766	767	790	770	735	754	762	786	772	754	765	768	786	793
48	789	775	783	757	764	782	765	728	749	753	783	766	749	756	764	781	789
49	785	771	776	751	759	775	757	721	742	747	779	758	742	748	758	773	785
50	784	768	768	743	754	769	750	715	728	740	771	747	735	740	754	766	784
51	782	763	761	737	749	762	745	708	716	733	760	739	730	733	751	759	782
52	779	758	757	730	742	754	739	700	705	727	746	728	725	724	747	748	779
53	775	753	754	724	734	745	731	693	698	722	736	720	718	717	744	741	775
54	769	746	750	716	725	737	723	686	694	716	725	716	711	712	741	734	769
55	766	738	743	705	718	730	714	681	692	711	720	712	706	705	738	729	766
56	765	730	736	695	710	727	703	676	684	705	716	709	701	700	730	722	765
57	760	723	725	684	704	720	690	669	674	698	711	701	695	696	720	715	760
58	747	715	716	679	695	710	677	661	661	687	702	689	688	694	710	708	747
59	736	708	706	673	687	695	660	655	648	673	695	674	681	693	698	701	736
60	724	699	699	667	677	682	646	647	636	657	687	662	668	693	688	690	724

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61	716	693	692	657	666	669	636	636	625	645	675	656	652	686	673	684	716
62	706	684	681	651	656	659	626	624	612	632	660	652	637	677	661	677	706
63	695	674	668	644	644	650	619	614	600	622	646	648	625	666	646	668	695
64	680	656	652	638	634	643	611	604	591	611	632	644	613	656	635	657	680
65	668	642	642	628	622	635	605	596	584	602	622	636	602	646	622	649	668
66	655	629	634	621	613	631	600	586	574	592	610	628	591	640	612	641	655
67	646	621	627	611	601	627	592	577	565	584	599	621	583	631	600	634	646
68	636	612	614	602	590	621	582	565	559	577	589	614	573	623	591	628	636
69	625	605	603	595	579	612	574	555	556	573	581	604	565	612	580	619	625
70	616	594	589	581	574	603	571	547	551	569	570	591	558	601	571	612	616
71	605	586	580	574	571	591	565	541	544	568	560	575	549	589	561	603	605
72	598	578	571	564	568	583	558	532	540	565	554	560	541	583	555	594	598
73	588	573	565	555	564	579	556	526	536	559	550	553	535	580	550	583	588
74	580	568	558	548	559	573	554	523	531	553	546	544	530	576	547	572	580
75	572	567	555	541	552	568	550	520	529	550	540	534	526	571	541	563	572
76	567	565	553	538	548	564	545	517	529	547	535	527	523	566	536	557	567
77	562	560	551	536	547	561	541	515	531	544	530	525	521	560	530	553	562
78	555	555	549	537	548	557	536	514	534	542	527	525	520	555	526	548	555
79	553	550	547	539	551	555	536	512	538	543	526	525	520	548	521	545	553
80	550	545	547	539	556	555	537	510	544	544	525	524	522	544	517	541	550
81	550	542	547	536	559	549	536	503	547	540	527	524	526	541	512	537	550
82	551	540	548	532	562	538	533	497	548	533	528	522	532	542	510	533	551
83	552	541	550	524	563	528	528	494	543	520	527	518	535	545	508	531	552
84	552	542	553	516	563	515	520	490	531	507	523	512	536	546	508	529	552
85	555	540	557	509	560	501	511	484	520	495	518	507	534	545	511	526	555
86	556	536	556	506	549	489	501	478	503	482	511	504	528	543	515	523	556
87	557	525	550	502	537	476	487	470	488	472	499	500	521	535	519	520	557
88	554	514	543	499	522	465	473	460	478	464	488	494	509	527	520	514	554
89	547	500	532	495	509	452	460	449	465	450	477	488	497	514	517	509	547
90	538	486	521	491	493	439	441	440	450	436	461	481	485	503	512	502	538
91	527	469	505	487	481	421	422	428	438	424	446	469	469	493	506	497	527
92	516	456	491	478	471	403	404	420	424	409	434	457	456	480	496	491	516

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93	503	443	476	467	457	391	392	415	412	395	418	446	448	470	488	482	503
94	492	432	465	453	445	377	378	406	403	380	400	432	437	460	477	474	492
95	481	422	454	442	425	365	365	391	397	367	383	416	422	453	463	462	481
96	472	410	442	427	409	355	354	377	388	354	370	405	413	445	451	454	472
97	457	400	433	416	391	343	344	369	379	342	358	389	405	441	437	443	457
98	442	387	421	406	378	331	335	361	372	332	353	376	394	434	427	433	442
99	425	377	411	397	367	327	330	353	362	320	350	370	383	423	414	421	425
100	409	364	400	390	357	323	325	344	352	312	348	368	375	413	404	408	409
101	399	353	388	383	354	326	318	334	344	311	345	363	366	398	394	399	399
102	387	341	380	375	351	328	309	324	335	309	340	354	358	387	383	388	387
103	376	329	371	366	350	328	301	317	328	304	332	345	353	378	374	380	376
104	364	322	365	362	344	320	290	306	321	299	326	333	347	371	365	375	364
105	357	318	356	358	337	308	284	293	310	292	319	321	343	363	359	374	357
106	351	315	350	352	331	290	279	285	300	283	307	307	339	354	350	368	351
107	344	315	344	344	323	273	277	273	289	273	292	294	328	346	345	357	344
108	339	313	337	334	315	258	271	261	275	259	282	284	317	338	340	350	339
109	336	312	329	324	305	238	256	252	261	245	274	275	307	332	336	339	336
110	332	304	317	312	298	216	238	243	251	235	268	266	296	325	328	329	332
111	325	292	307	301	289	206	230	234	243	225	255	263	284	315	315	324	325
112	313	276	299	290	281	204	228	229	237	215	239	263	271	308	307	317	313
113	303	262	286	275	270	213	224	220	231	208	228	254	258	300	297	305	303
114	295	250	275	267	255	218	216	211	219	199	224	244	247	289	281	287	295
115	289	236	259	258	244	222	203	202	204	188	223	231	235	277	268	277	289
116	280	223	249	252	231	213	197	189	195	180	222	227	229	268	257	267	280
117	272	210	242	246	221	192	190	184	188	175	215	221	225	259	254	261	272
118	264	202	237	235	212	167	183	183	190	174	210	214	220	245	244	256	264
119	258	197	230	227	204	144	169	177	188	170	203	201	212	232	236	245	258
120	254	198	223	222	197	130	152	166	176	162	187	187	202	223	225	236	254
121	248	201	216	216	193	123	132	152	156	146	170	170	191	221	220	227	248
122	244	201	204	206	191	117	114	131	138	127	153	153	182	215	215	221	244
123	238	198	198	199	191	106	109	118	123	109	129	136	178	210	208	217	238
124	227	190	195	188	181	91	104	105	115	99	117	123	159	205	203	215	227

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125	215	180	190	177	151	82	103	101	109	93	109	118	143	201	196	206	215
126	199	168	177	164	129	81	103	97	104	88	102	112	128	199	188	191	199
127	185	158	165	151	114	83	91	93	97	93	96	109	119	198	177	178	185
128	172	143	150	140	105	85	86	87	90	88	94	107	114	188	175	163	172
129	156	129	134	127	100	84	83	82	93	86	91	97	105	168	169	141	156
130	137	118	125	120	96	80	78	76	87	80	88	93	99	152	154	118	137
131	123	110	115	111	95	76	72	69	82	70	82	90	92	137	142	116	123
132	120	106	107	105	90	74	63	64	70	68	77	86	85	126	128	117	120
133	117	100	99	102	82	72	58	59	62	63	69	87	81	119	119	115	117
134	116	99	96	95	79	64	52	55	58	60	62	76	75	116	112	105	116
135	104	96	93	88	73	59	49	50	56	53	62	70	71	116	103	94	104
136	95	92	89	83	69	55	44	47	45	48	58	66	71	105	96	92	95
137	92	89	88	78	69	47	43	42	44	46	52	62	65	95	88	86	92
138	88	85	79	69	66	43	37	36	38	41	46	53	60	88	81	81	88
139	83	79	70	65	58	36	31	36	36	39	42	49	58	84	82	90	83
140	78	76	71	62	53	32	28	27	31	31	37	42	51	85	76	87	78
141	74	71	67	59	49	28	25	25	25	26	33	36	43	83	73	82	74
142	69	65	60	50	43	25	21	23	23	23	30	29	40	73	66	70	69
143	65	61	52	47	42	21	20	20	19	20	26	25	33	67	65	67	65
144	58	54	50	44	37	19	17	18	17	18	22	23	28	65	62	64	58
145	52	47	43	38	32	17	15	16	16	17	19	22	26	50	53	58	52
146	44	44	39	36	28	14	14	14	13	14	17	20	22	49	44	53	44
147	39	37	33	27	26	13	13	12	12	12	15	17	20	45	44	47	39
148	35	32	29	25	22	12	11	12	10	11	14	15	19	38	34	38	35
149	29	27	25	22	20	11	10	9	9	11	12	14	16	30	32	32	29
150	26	24	23	19	17	9	8	8	8	9	11	12	14	25	27	28	26
151	23	21	20	18	15	8	7	7	7	8	10	11	14	23	24	25	23
152	20	18	17	16	13	7	6	6	6	7	8	9	11	22	20	22	20
153	18	16	15	14	12	6	5	5	5	6	7	8	10	20	18	21	18
154	16	14	14	12	10	5	4	4	4	5	6	7	9	17	17	19	16
155	15	13	12	11	9	4	4	4	4	4	5	6	7	15	15	17	15
156	14	11	11	9	8	3	3	3	3	4	4	5	6	14	14	16	14

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

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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 *******