



Report No.: GZE160347-K

NVLAP LAB CODE 201011-0

## LM-79-08 Test Report

For

### LIGHT EFFICIENT DESIGN

(Brand Name:N/A)

188 S. Northwest Highway Cary, IL 60013

### LED Lamp

Model name(s): LED-8036M40-A

Representative (Tested) Model: LED-8036M40-A

Model Different :N/A

Test & Report By:

*Jack Luo*

Engineer: Jack Luo

Date: Apr.28,2016

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

Tel: 8620-3229 0320

Fax: 8620-32290422

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

U.S. Department of Energy

**Lighting Facts™ Uniform LM-79 Reporting Template**
**Laboratory Information:**

Name of Test Laboratory	Standard-Tech Co., Ltd.
Date of Test Report	Apr.28,2016
Test Report No.	GZE160347-K
Laboratory Contact Name	Tommy Liang

**Product Information:**

Organization Name	LIGHT EFFICIENT DESIGN		
Brand Name	N/A		
Model Number	LED-8036M40-A		
SKU (if available)	N/A		
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Lamp		
Luminaire Aperture (for downlights)	--	in.	
Luminaire Length	--	mm	
Luminaires Width	--	mm	
Number of Units (modular products)	N/A	s	

**Integrating Sphere**
**Goniophotometer**
**Electrical Measurements:**

	Output	Output	
Input Wattage	--	96.55	W
Input Current	--	0.8392	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9588	
Off-State Power	--	0	W

**Photometric Characteristics**

Total Initial Lumen Output	--	10656	lm
Initial Lumen Efficacy	--	110.37	lm/w
Correlated color temperature / CCT	4122	--	K
Color rendering index / CRI	85.3	--	
R9 Value	20	--	
Duv	-0.0008	--	
<b>Luminous Intensity Distribution</b>			
Center beam candlepower (if applicable)		2853	cd
Beam angle (if applicable)		107.8	°
Zonal lumens in the 0°-60° zone		65.2	%
Zonal lumens in the 60°-90° zone	-----	20.6	%
Zonal lumens in the 90°-120° zone		10.9	%
Zonal lumens in the 120°-180° zone		3.3	%

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Test Specifications:	
Date of Receipt	: Apr.01,2016
Date of Test	: Apr.24,2016
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry IESNA LM-16-93 Practical Guide to Colorimetry of Light Source IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

### Test Methods

#### 1. Photometric and Electrical measurements – Light Distribution 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 120 Volts, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  horizontal intervals.

#### 2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric 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 120 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

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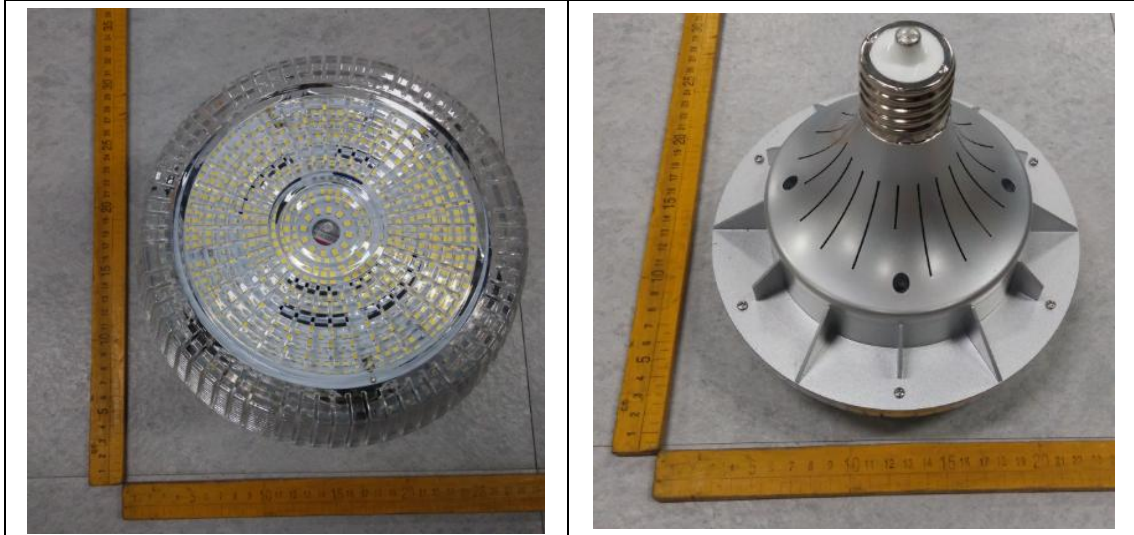
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**1. Product Information:**

Brand Name	N/A
Model Number	LED-8036M40-A
Luminaire Type	LED Lamp
Rated Voltage / Frequency	120~277 Vac, 50/60Hz
Nominal Power	100W
Rated Initial Lamp Lumen	--
Declared CCT	4000K
LED Manufacturer	N/A
LED Model	N/A
Sample Receipt Date	Apr.01,2016
Sample Number	GZE160347-K1(4000K)

**Photo**



<b>2.1 Electrical, Photometric and Chromaticity Measurements</b> (Refer to Work Instruction QD25)	<b>IES LM-79 2008</b>
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<b>Test date</b>	2016-04-24	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	LED-8036M40-A		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160347	120.0	60	0.8392	96.55	0.9588	14.63
-K1	277.0	60	0.4026	100.9	0.9046	17.41

**Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	85.3
R9	20
CCT (K)	4122
Chromaticity (x, y)	x=0.3747 y=0.3714
Chromaticity (u', v')	u'=0.2234 v'=0.4983
Duv	-0.0008

Special Color Rendering Indices			
R1	85	R9	20
R2	93	R10	82
R3	96	R11	81
R4	82	R12	65
R5	84	R13	87
R6	89	R14	98
R7	86	R15	79
R8	68	--	--

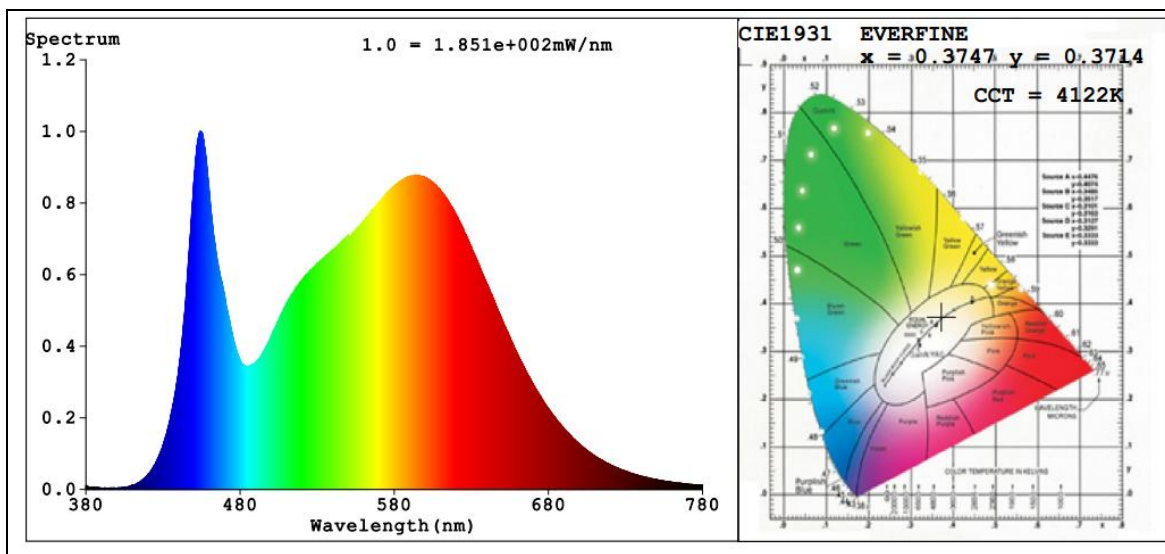
**Goniophotometer Method :**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	10656
Luminous Efficacy (lm/W)	110.37
Beam Angle°	107.8
Center Beam Candle Power (cd)	2853

**Goniophotometer Methodn :**

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	11317
Luminous Efficacy (lm/W)	112.16

**Spectral Power Distribution & Chromaticity Diagram**



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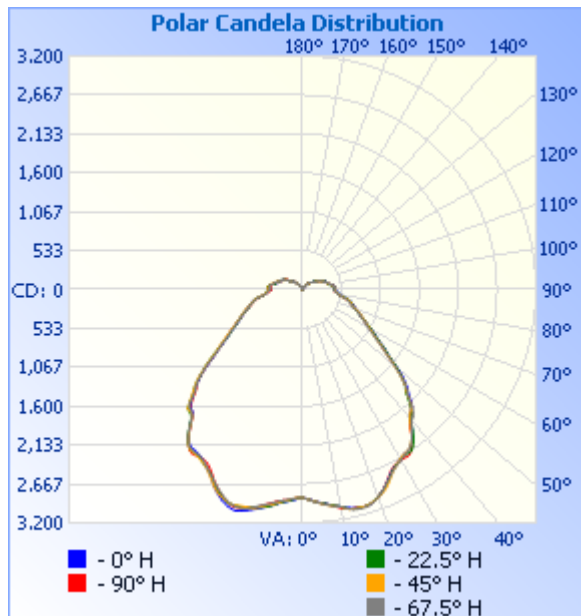
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**Zonal Lumen Tabulation**

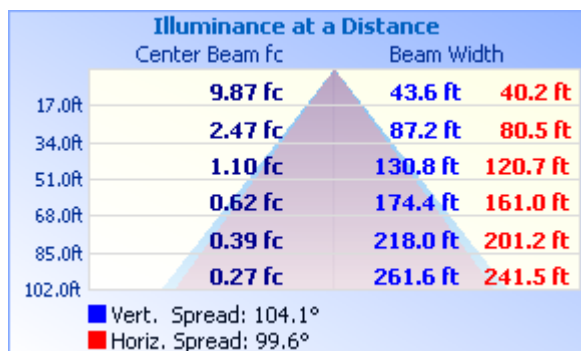
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	2,477.4	23.3%
0-40	4,097.4	38.5%
0-60	6,944.4	65.2%
60-90	2,197.9	20.6%
70-100	1,755.2	16.5%
90-120	1,162.7	10.9%
0-90	9,142.4	85.8%
90-180	1,512.9	14.2%
0-180	10,655.3	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	282.0	2.6%	90-100	483.5	4.5%
10-20	872.9	8.2%	100-110	387.0	3.6%
20-30	1,322.5	12.4%	110-120	292.1	2.7%
30-40	1,620.0	15.2%	120-130	178.6	1.7%
40-50	1,612.7	15.1%	130-140	105.8	1%
50-60	1,234.3	11.6%	140-150	46.4	0.4%
60-70	926.3	8.7%	150-160	14.6	0.1%
70-80	736.0	6.9%	160-170	3.8	0%
80-90	535.6	5.0%	170-180	1.0	0%

### Photometric Data

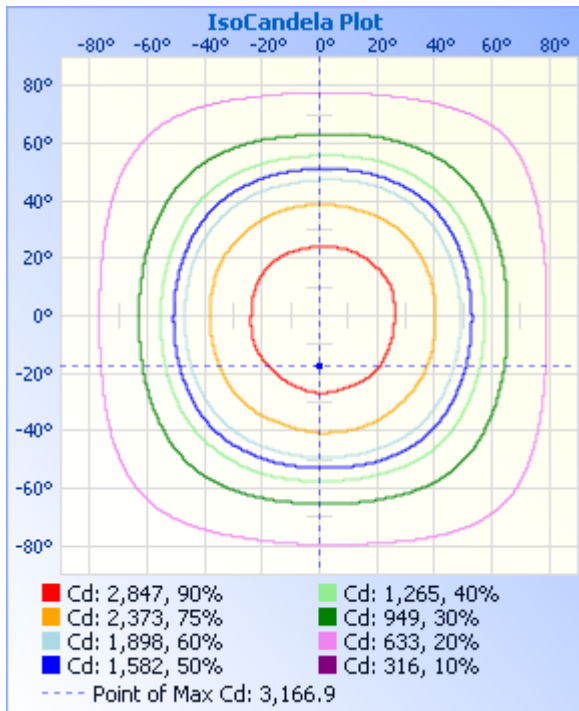


### Illuminance Plots

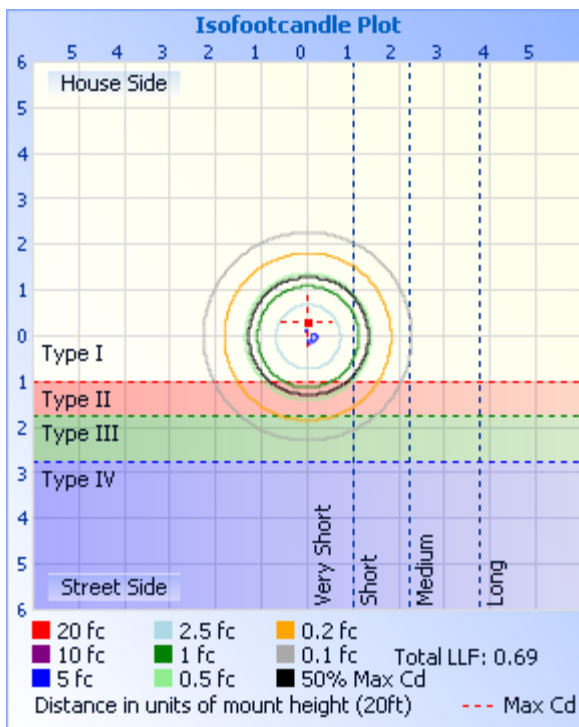




### ISOCANDELA DIAGRAM



### ISOLUX DIAGRAM



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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	2853	2853	2853	2853	2853	2853	2853	2853	2853	2853	2853	2853	2853	2853	2853	2853	2853
1	2867	2869	2869	2869	2868	2868	2866	2862	2859	2853	2849	2850	2852	2858	2860	2862	2867
2	2879	2886	2885	2888	2884	2888	2880	2880	2878	2869	2860	2860	2862	2868	2873	2878	2879
3	2903	2904	2905	2910	2903	2906	2893	2893	2893	2886	2874	2874	2879	2884	2888	2896	2903
4	2920	2923	2921	2926	2923	2923	2909	2908	2907	2904	2894	2885	2893	2897	2904	2906	2920
5	2933	2935	2944	2944	2939	2941	2920	2919	2921	2917	2909	2899	2899	2906	2915	2926	2933
6	2949	2952	2963	2961	2953	2959	2937	2937	2937	2932	2926	2910	2912	2921	2927	2941	2949
7	2967	2968	2979	2977	2972	2978	2954	2954	2961	2957	2950	2931	2925	2944	2941	2950	2967
8	2985	2984	2995	2997	2992	2999	2977	2977	2983	2987	2974	2954	2950	2969	2957	2962	2985
9	3001	3002	3007	3009	3016	3016	2996	2998	3008	3012	2990	2975	2971	2990	2985	2978	3001
10	3022	3021	3026	3026	3040	3037	3007	3019	3028	3024	3009	2994	2991	3011	3011	3001	3022
11	3041	3047	3057	3047	3061	3054	3021	3045	3048	3039	3033	3015	3021	3036	3024	3029	3041
12	3058	3070	3076	3073	3075	3066	3038	3065	3073	3049	3057	3037	3054	3064	3040	3051	3058
13	3074	3084	3082	3094	3079	3071	3059	3086	3093	3062	3074	3064	3070	3088	3057	3060	3074
14	3081	3090	3083	3101	3080	3074	3070	3104	3117	3084	3077	3092	3083	3105	3077	3070	3081
15	3087	3090	3089	3106	3085	3083	3071	3117	3137	3096	3080	3110	3098	3117	3084	3068	3087
16	3093	3092	3092	3105	3091	3087	3076	3125	3156	3099	3086	3114	3111	3131	3083	3076	3093
17	3092	3085	3091	3095	3086	3085	3074	3131	3167	3100	3094	3115	3121	3135	3085	3081	3092
18	3079	3070	3072	3083	3070	3075	3060	3122	3161	3103	3099	3101	3117	3132	3080	3076	3079
19	3055	3047	3052	3056	3050	3068	3042	3099	3142	3097	3094	3088	3099	3120	3069	3061	3055
20	3029	3020	3033	3027	3022	3057	3017	3070	3117	3083	3077	3062	3072	3101	3049	3045	3029
21	2997	2990	3007	2996	2988	3032	2984	3041	3088	3055	3055	3031	3042	3075	3025	3024	2997
22	2958	2959	2982	2957	2952	2991	2951	2998	3053	3023	3039	2997	3012	3048	2995	2994	2958
23	2916	2919	2945	2913	2906	2943	2915	2948	3012	2985	3009	2964	2970	3014	2960	2951	2916
24	2868	2878	2896	2874	2860	2888	2873	2902	2968	2941	2968	2924	2924	2974	2917	2905	2868
25	2821	2831	2847	2835	2811	2834	2834	2863	2915	2899	2918	2884	2879	2926	2872	2856	2821
26	2778	2786	2802	2795	2767	2784	2794	2831	2862	2851	2872	2847	2827	2875	2824	2809	2778
27	2747	2751	2766	2765	2734	2741	2758	2801	2819	2810	2829	2811	2780	2830	2776	2763	2747
28	2725	2725	2735	2738	2714	2708	2724	2771	2786	2779	2788	2775	2741	2785	2730	2725	2725

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29	2707	2704	2710	2715	2701	2690	2705	2747	2756	2757	2762	2742	2713	2741	2699	2690	2707
30	2686	2688	2681	2693	2691	2673	2690	2721	2723	2735	2738	2712	2697	2707	2675	2663	2686
31	2663	2673	2656	2675	2695	2661	2669	2699	2692	2713	2720	2690	2689	2682	2655	2643	2663
32	2645	2667	2645	2659	2699	2663	2661	2683	2670	2695	2705	2678	2691	2672	2642	2634	2645
33	2639	2668	2635	2644	2690	2662	2655	2674	2660	2686	2698	2676	2706	2676	2636	2640	2639
34	2625	2663	2619	2622	2664	2651	2645	2672	2652	2684	2693	2674	2710	2686	2626	2643	2625
35	2597	2631	2587	2588	2614	2620	2627	2654	2651	2677	2682	2664	2693	2682	2612	2623	2597
36	2554	2584	2540	2539	2552	2563	2590	2609	2630	2652	2654	2641	2655	2656	2591	2581	2554
37	2499	2526	2482	2486	2481	2493	2539	2540	2588	2612	2604	2607	2600	2613	2561	2521	2499
38	2442	2449	2409	2426	2401	2414	2468	2457	2536	2557	2540	2550	2536	2548	2515	2456	2442
39	2372	2369	2341	2366	2327	2341	2388	2371	2464	2477	2460	2478	2462	2461	2441	2377	2372
40	2307	2301	2294	2331	2284	2284	2316	2295	2388	2398	2379	2389	2375	2379	2363	2305	2307
41	2256	2263	2250	2310	2265	2250	2278	2244	2314	2328	2307	2311	2301	2300	2298	2257	2256
42	2230	2228	2228	2270	2225	2230	2267	2232	2254	2290	2273	2268	2265	2259	2257	2248	2230
43	2204	2174	2200	2206	2180	2200	2217	2234	2239	2282	2277	2248	2240	2235	2229	2240	2204
44	2146	2090	2119	2116	2122	2141	2147	2203	2227	2262	2268	2229	2205	2196	2206	2214	2146
45	2071	2019	2039	2043	2032	2085	2081	2124	2166	2194	2199	2186	2144	2132	2141	2141	2071
46	2009	1961	1981	1997	1976	2023	2031	2049	2093	2103	2119	2083	2067	2076	2080	2066	2009
47	1956	1927	1929	1927	1928	1953	1987	1994	2040	2039	2055	2004	1994	2017	2012	2010	1956
48	1883	1856	1859	1858	1857	1882	1920	1945	1969	1989	1993	1966	1966	1952	1957	1960	1883
49	1816	1781	1763	1765	1783	1791	1833	1879	1891	1918	1926	1901	1898	1876	1882	1878	1816
50	1732	1710	1665	1668	1698	1711	1749	1791	1825	1833	1857	1823	1815	1793	1798	1774	1732
51	1623	1622	1587	1578	1596	1619	1661	1701	1730	1752	1756	1738	1736	1700	1701	1676	1623
52	1531	1529	1505	1489	1500	1523	1573	1606	1634	1670	1669	1647	1643	1618	1597	1583	1531
53	1459	1450	1425	1418	1431	1447	1489	1518	1534	1577	1580	1550	1543	1533	1506	1498	1459
54	1402	1390	1371	1356	1362	1388	1406	1447	1459	1492	1489	1462	1463	1444	1422	1420	1402
55	1334	1327	1303	1285	1303	1329	1335	1384	1396	1416	1416	1391	1394	1377	1352	1364	1334
56	1266	1262	1239	1225	1247	1259	1273	1320	1324	1343	1360	1332	1334	1317	1292	1304	1266
57	1213	1207	1184	1171	1195	1202	1227	1264	1260	1276	1300	1273	1275	1254	1239	1251	1213
58	1170	1163	1139	1127	1151	1154	1175	1217	1212	1210	1250	1218	1221	1200	1195	1201	1170
59	1126	1122	1100	1080	1106	1107	1133	1173	1167	1163	1201	1171	1178	1159	1155	1160	1126
60	1079	1080	1063	1039	1059	1064	1092	1127	1124	1127	1154	1135	1136	1121	1111	1115	1079

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61	1033	1040	1030	1006	1024	1027	1059	1081	1079	1082	1108	1091	1093	1076	1068	1070	1033
62	993	1003	991	977	993	993	1028	1043	1038	1046	1069	1049	1056	1040	1032	1036	993
63	956	965	955	944	958	960	995	1007	1003	1014	1033	1019	1022	1008	999	1000	956
64	921	930	926	914	928	932	958	969	969	982	998	985	987	970	963	964	921
65	892	902	901	886	902	904	929	939	943	953	963	953	949	936	932	928	892
66	866	872	877	864	875	875	903	912	921	929	937	928	923	908	902	897	866
67	843	843	851	840	848	852	872	885	897	905	915	907	902	886	872	864	843
68	821	814	826	816	818	828	846	864	874	881	893	878	873	858	842	837	821
69	799	789	803	788	791	804	820	839	858	854	868	852	847	835	815	815	799
70	780	769	779	757	767	780	788	809	833	826	845	832	822	811	788	792	780
71	764	748	753	732	745	756	762	778	806	797	822	805	796	785	767	771	764
72	744	728	730	713	725	728	743	758	782	773	796	783	771	765	747	753	744
73	728	714	710	696	710	708	723	738	762	758	773	762	751	741	728	737	728
74	711	700	694	676	693	690	708	725	744	738	746	741	732	724	711	722	711
75	697	686	683	662	678	673	690	709	730	723	727	722	713	710	693	701	697
76	680	674	670	648	662	657	675	692	713	707	712	701	697	692	676	684	680
77	659	656	647	627	641	637	656	674	698	692	695	685	680	675	657	665	659
78	633	627	618	601	610	610	630	647	675	675	675	663	658	649	635	638	633
79	600	592	583	570	574	575	599	616	647	648	650	639	629	619	609	608	600
80	566	558	550	538	541	540	565	585	616	617	620	610	603	587	576	575	566
81	536	529	525	515	516	513	537	555	578	580	588	578	570	558	545	546	536
82	514	511	512	499	499	496	515	529	547	547	557	547	541	532	516	524	514
83	500	497	497	487	487	488	500	509	525	523	533	521	519	511	497	509	500
84	492	490	485	478	478	481	489	496	510	510	516	503	503	498	485	498	492
85	489	484	476	469	469	472	480	486	500	506	502	492	491	490	477	489	489
86	483	476	469	459	457	458	469	476	495	504	494	484	480	480	471	480	483
87	471	461	460	448	442	443	455	466	486	497	487	477	467	468	463	472	471
88	458	447	451	436	428	429	440	455	474	485	479	468	452	454	452	462	458
89	443	436	443	428	422	419	428	445	461	469	471	457	438	441	442	454	443
90	441	437	446	432	429	429	430	444	453	454	464	446	428	432	433	450	441
91	440	441	453	439	436	442	443	457	463	451	461	439	428	435	433	454	440
92	443	443	457	444	440	449	455	466	473	460	466	444	437	443	435	453	443

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93	448	441	453	446	443	452	461	469	477	467	471	449	443	447	440	451	448
94	451	437	444	446	443	453	465	468	474	474	473	454	449	453	447	449	451
95	447	434	434	444	443	450	462	460	469	476	470	458	450	455	452	449	447
96	440	430	426	437	441	446	455	450	463	471	464	456	448	450	451	448	440
97	434	422	421	430	433	434	445	439	457	465	457	453	447	445	442	443	434
98	425	413	418	421	420	423	438	429	450	452	450	448	444	440	431	434	425
99	412	400	411	409	405	410	431	422	443	440	444	438	434	432	422	423	412
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101	379	374	386	389	383	392	401	406	407	408	426	416	413	408	404	402	379
102	370	363	377	379	375	379	388	393	390	393	414	408	400	399	394	388	370
103	366	358	366	371	364	366	377	379	377	381	403	399	389	386	383	376	366
104	363	356	359	363	356	355	371	370	371	374	393	391	378	373	377	369	363
105	358	353	354	356	349	349	367	367	368	373	385	384	369	361	370	364	358
106	353	346	349	352	342	346	356	362	364	369	381	376	362	354	362	357	353
107	345	336	343	341	337	338	344	354	353	361	374	368	353	350	355	348	345
108	337	332	334	331	331	327	330	347	344	352	362	361	344	344	349	343	337
109	335	330	324	319	326	319	324	339	335	347	354	350	340	338	344	335	335
110	331	325	317	311	320	315	321	330	328	346	348	338	337	332	334	328	331
111	325	320	309	307	313	311	313	318	325	340	340	331	334	329	323	324	325
112	320	313	299	304	307	302	311	305	325	331	328	322	327	325	315	319	320
113	316	305	288	297	299	299	307	295	321	326	314	312	320	317	309	309	316
114	308	295	280	284	290	294	298	288	319	321	301	307	315	309	301	299	308
115	296	287	274	274	285	289	289	287	312	311	295	304	310	304	289	295	296
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118	273	268	257	251	263	260	267	269	276	288	280	297	292	283	274	263	273
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122	224	214	207	199	211	209	213	226	234	243	246	253	266	251	227	221	224
123	212	205	194	197	198	194	202	212	220	229	230	233	252	237	216	210	212
124	203	200	183	194	188	182	193	198	210	218	212	221	233	223	206	199	203

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125	194	192	175	188	177	172	187	189	204	208	200	209	218	208	196	189	194
126	182	182	172	179	170	162	181	183	195	198	188	198	202	191	185	178	182
127	175	172	169	170	167	157	177	175	183	187	178	187	187	177	177	170	175
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129	162	159	159	161	159	157	164	163	171	169	161	171	170	161	171	157	162
130	158	156	154	159	158	157	159	160	167	165	157	168	167	156	167	155	158
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132	152	149	151	147	151	146	154	156	160	161	156	165	158	153	159	151	152
133	145	141	146	145	142	137	152	150	155	158	158	163	157	150	156	145	145
134	137	137	135	142	134	129	146	139	146	149	155	158	154	145	149	137	137
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157	22	22	24	22	23	24	24	25	26	26	27	27	26	25	24	24	22
158	21	21	22	21	21	22	22	23	24	24	25	25	23	23	22	22	21
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166	10	10	10	10	10	10	10	10	10	10	11	11	11	11	11	10	10
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170	10	10	10	10	11	11	11	11	11	11	11	11	11	11	11	10	10
171	10	10	10	10	11	11	11	11	11	11	11	11	10	11	10	10	10
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180	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

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**3. Test Equipment**

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2015-07-01	2016-06-30
ST-R-331	Spectral analysis system HAAS-2000	2015-07-01	2016-06-30
D204	Standard Lamp	2015-07-01	2016-06-30
PF2010	Power Meter for Integrating Sphere	2015-07-01	2016-06-30
EE-09	Goniophotometer system	2015-07-01	2016-06-30
D908S	Standard Lamp	2015-07-01	2016-06-30
PF210	Power Meter for Goniophotometer	2015-07-01	2016-06-30
ST-R-181A	Temperature Tester	2015-07-01	2016-06-30
Uncertainty Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

**\*\*\*\*\* END OF DATASHEET PACKAGE \*\*\*\*\***

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