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-8034M50-HV

Representative (Tested) Model: LED-8034M50-HV

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.

NVLAP LAB CODE 201011-0

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-B
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8034M50-HV	
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

Electrical Measurements:	**Integrating Sphere Output**	**Goniophotometer Output**	
Input Wattage	--	154.7	W
Input Current	--	0.5686	A
Input Voltage (ac)	--	277.0	V
Power Factor	--	0.9822	
Off-State Power	--	0	W
Photometric Characteristics			
Total Initial Lumen Output	--	19022	lm
Initial Lumen Efficacy	--	122.96	lm/w
Correlated color temperature / CCT	5130	--	K
Color rendering index / CRI	85.7	--	
R9 Value	20	--	
Duv	0.0020	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	-----	7210	cd
Beam angle (if applicable)		103.3	°
Zonal lumens in the 0°-60° zone		80.7	%
Zonal lumens in the 60°-90° zone		16.2	%
Zonal lumens in the 90°-120° zone		1.5	%
Zonal lumens in the 120°-180° zone		1.6	%

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° 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 Volts, 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.

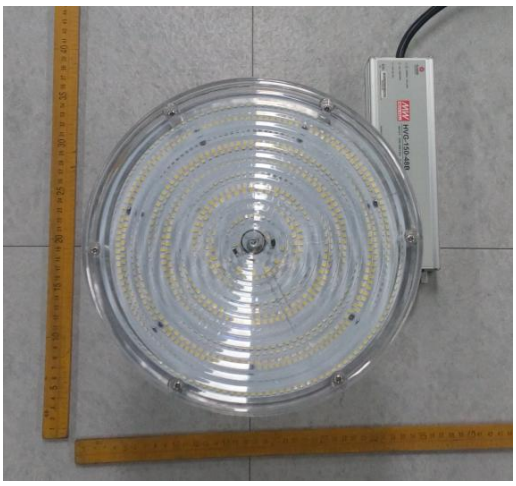
2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° 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 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.

1. Product Information:

Brand Name	N/A
Model Number	LED-8034M50-HV
Luminaire Type	LED Lamp
Rated Voltage / Frequency	240~480 Vac, 50/60Hz
Nominal Power	150W
Rated Initial Lamp Lumen	--
Declared CCT	5000K
LED Manufacturer	N/A
LED Model	N/A
Sample Receipt Date	Apr.01,2016
Sample Number	GZE160347-B1(5000K)

Photo



2.1 Electrical, Photometric and Chromaticity Measurements *(Refer to Work Instruction QD25)*	**IES LM-79 2008**

Test date	2016-04-24	**Test Ambient:**	25.2 °C
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	LED-8034M50-HV		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160347	277.0	60	0.5686	154.7	0.9822	8.25
-B1	480.0	60	0.3464	154.9	0.9315	10.59

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Color Rendering Index (CRI)	85.7
R9	20
CCT (K)	5130
Chromaticity (x, y)	x=0.3419 y=0.3530
Chromaticity (u', v')	u'=0.2087 v'=0.4849
Duv	0.0020

Special Color Rendering Indices			
R1	85	R9	20
R2	94	R10	83
R3	95	R11	82
R4	82	R12	64
R5	86	R13	88
R6	89	R14	98
R7	86	R15	80
R8	69	--	--

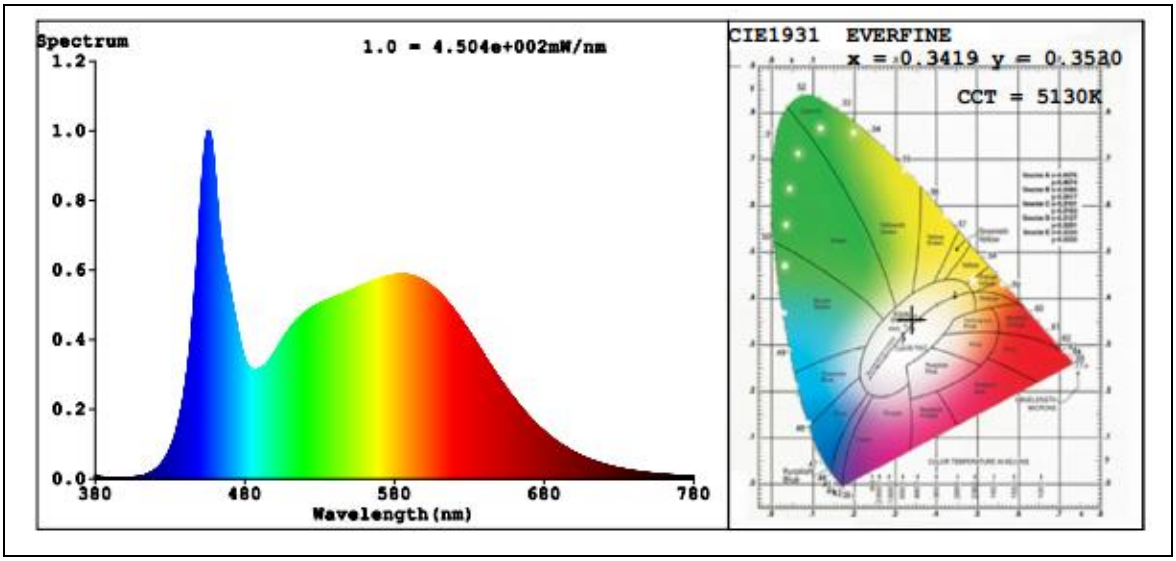
Goniophotometer Method :

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	19022
Luminous Efficacy (lm/W)	122.96
Beam Angle°	103.3
Center Beam Candle Power (cd)	7210

Goniophotometer Methodn :

Parameter	Result
Test Voltage (V)	480.0
Frequency (Hz)	60
Total Luminous (lm)	19139
Luminous Efficacy (lm/W)	123.56

Spectral Power Distribution & Chromaticity Diagram



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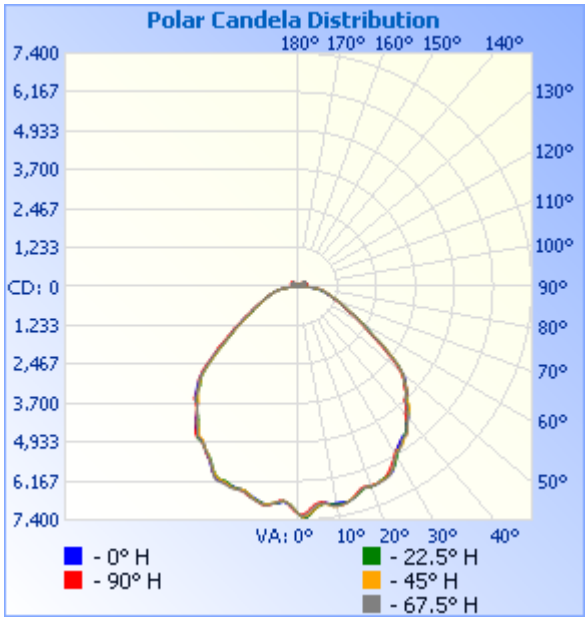
Zonal Lumen Tabulation

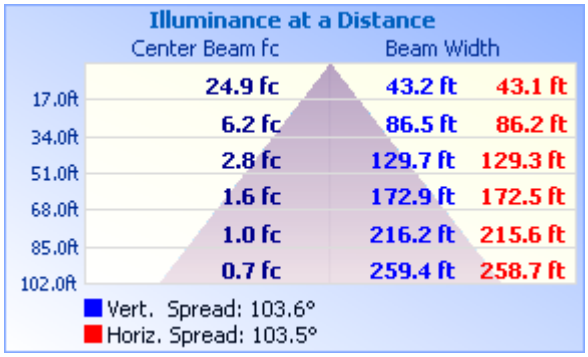
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	5,576.3	29.3%
0-40	9,125.4	48%
0-60	15,354.2	80.7%
60-90	3,072.3	16.2%
70-100	1,525.2	8%
90-120	283.2	1.5%
0-90	18,426.5	96.9%
90-180	594.0	3.1%
0-180	19,020.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	664.2	3.5%	90-100	41.3	0.2%
10-20	1,926.5	10.1%	100-110	106.2	0.6%
20-30	2,985.7	15.7%	110-120	135.7	0.7%
30-40	3,549.1	18.7%	120-130	142.3	0.7%
40-50	3,591.7	18.9%	130-140	105.6	0.6%
50-60	2,637.1	13.9%	140-150	39.0	0.2%
60-70	1,588.4	8.4%	150-160	16.3	0.1%
70-80	1,016.8	5.3%	160-170	6.0	0%
80-90	467.1	2.5%	170-180	1.7	0%

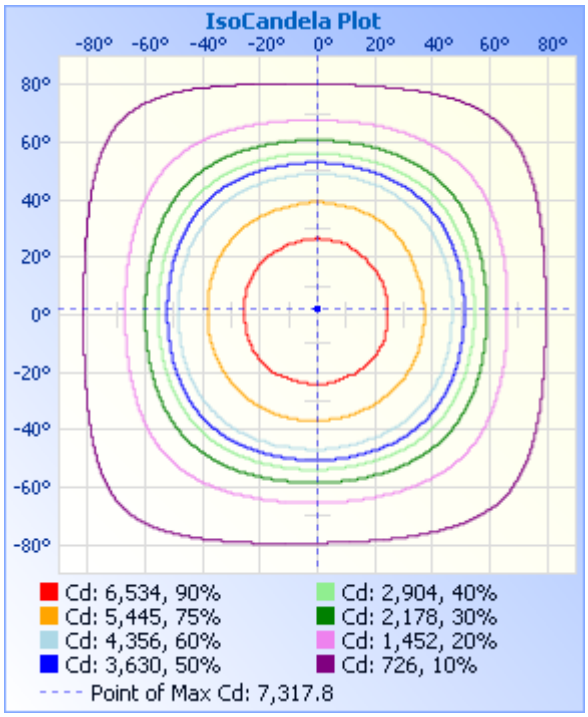
Photometric Data



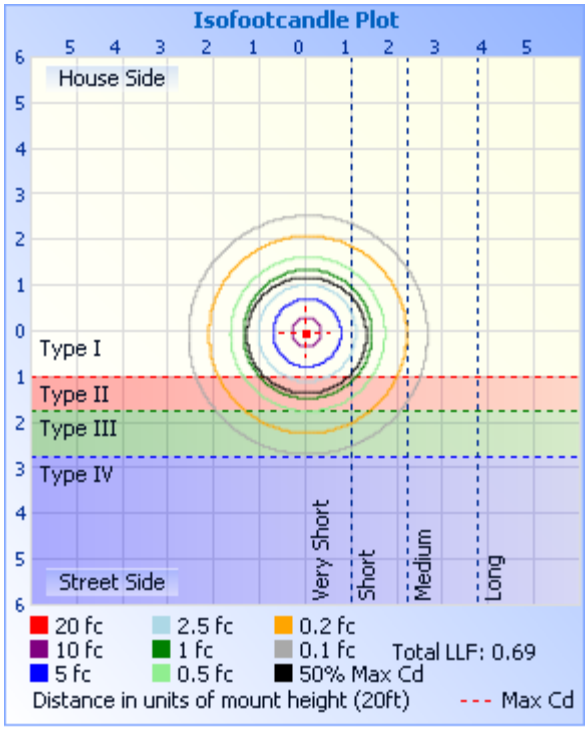
Illuminance Plots



ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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	7210	7210	7210	7210	7210	7210	7210	7210	7210	7210	7210	7210	7210	7210	7210	7210	7210
1	7309	**7318**	7306	7272	7234	7185	7130	7087	7066	7055	7066	7092	7132	7179	7228	7273	7309
2	7311	**7318**	7273	7219	7165	7086	7013	6963	6941	6928	6934	6965	7015	7090	7164	7240	7311
3	7208	7232	7192	7108	7045	6964	6911	6897	6883	6852	6848	6854	6882	6948	7042	7134	7208
4	7087	7107	7104	7002	6944	6897	6878	6854	6836	6821	6802	6795	6803	6841	6926	7028	7087
5	7002	7014	6993	6928	6890	6882	6873	6869	6876	6862	6839	6834	6810	6797	6842	6934	7002
6	6942	6952	6936	6903	6855	6893	6924	6940	6925	6895	6882	6884	6871	6814	6794	6868	6942
7	6911	6925	6938	6917	6893	6958	6968	6954	6937	6921	6920	6942	6946	6876	6823	6872	6911
8	6940	6944	6988	6979	6958	6989	6977	6961	6958	6958	6969	7000	7004	6945	6882	6921	6940
9	6967	6992	7055	7049	6985	7005	7004	6978	6967	6971	6988	7009	7019	6974	6925	6948	6967
10	6969	7021	7072	7061	7017	7039	7006	6960	6930	6938	6969	6977	6996	6985	6944	6973	6969
11	6965	7020	7064	7057	7056	7035	6963	6910	6882	6902	6926	6940	6936	6958	6957	6990	6965
12	6973	7015	7036	7040	7046	6991	6912	6864	6836	6858	6875	6898	6886	6903	6947	7000	6973
13	6992	7004	6987	7000	7003	6949	6858	6838	6784	6797	6803	6854	6843	6850	6916	6977	6992
14	6954	6957	6935	6956	6944	6877	6793	6792	6726	6726	6719	6780	6797	6807	6877	6916	6954
15	6902	6905	6884	6905	6862	6785	6735	6742	6683	6679	6671	6726	6739	6757	6825	6841	6902
16	6837	6856	6827	6827	6773	6719	6703	6728	6674	6680	6681	6716	6712	6714	6751	6730	6837
17	6751	6790	6748	6747	6703	6686	6698	6734	6677	6694	6713	6719	6712	6706	6711	6657	6751
18	6696	6727	6692	6710	6675	6692	6707	6715	6670	6682	6708	6732	6697	6703	6722	6648	6696
19	6714	6714	6711	6717	6692	6687	6712	6692	6664	6645	6692	6733	6684	6704	6745	6708	6714
20	6741	6744	6735	6723	6705	6690	6708	6654	6632	6591	6634	6693	6669	6695	6723	6705	6741
21	6744	6737	6724	6738	6709	6683	6686	6620	6629	6578	6613	6673	6648	6674	6707	6690	6744
22	6728	6725	6722	6730	6712	6696	6686	6630	6659	6590	6609	6676	6648	6644	6655	6656	6728
23	6674	6670	6686	6720	6714	6715	6682	6609	6630	6564	6579	6666	6640	6638	6617	6607	6674
24	6661	6646	6674	6708	6674	6697	6630	6532	6553	6496	6511	6599	6566	6609	6608	6611	6661
25	6674	6647	6672	6684	6597	6619	6549	6434	6456	6394	6411	6463	6468	6547	6557	6620	6674
26	6638	6592	6618	6622	6520	6513	6440	6329	6331	6272	6297	6280	6317	6461	6476	6581	6638
27	6563	6540	6531	6527	6422	6372	6305	6219	6219	6143	6186	6170	6191	6331	6373	6518	6563
28	6445	6462	6416	6391	6322	6245	6179	6114	6093	6048	6063	6097	6127	6215	6229	6415	6445

29	6290	6344	6280	6272	6224	6119	6093	6026	6012	5994	5981	6019	6042	6109	6129	6302	6290
30	6160	6226	6152	6167	6105	6038	6053	5967	5920	5931	5921	5943	5945	6007	6018	6157	6160
31	6044	6113	6057	6123	6022	5982	5993	5881	5829	5836	5840	5867	5867	5923	5965	6038	6044
32	5954	6033	6038	6059	5969	5890	5892	5806	5756	5781	5723	5783	5798	5854	5923	5988	5954
33	5886	5980	6017	5977	5889	5796	5812	5792	5728	5794	5698	5762	5765	5750	5850	5902	5886
34	5821	5922	5929	5871	5835	5767	5778	5778	5694	5744	5656	5728	5762	5660	5766	5791	5821
35	5773	5819	5843	5818	5824	5725	5733	5666	5604	5545	5519	5589	5696	5629	5764	5747	5773
36	5765	5744	5808	5812	5804	5633	5587	5531	5503	5418	5432	5473	5583	5565	5720	5756	5765
37	5700	5695	5744	5718	5696	5507	5454	5424	5376	5289	5322	5394	5445	5450	5575	5668	5700
38	5537	5565	5603	5590	5561	5408	5367	5314	5250	5186	5207	5202	5293	5332	5487	5541	5537
39	5474	5460	5476	5511	5425	5340	5295	5231	5121	5113	5117	5096	5138	5243	5413	5455	5474
40	5418	5388	5403	5369	5260	5237	5240	5135	4999	5002	5023	4997	5007	5207	5304	5345	5418
41	5271	5310	5293	5214	5172	5193	5102	4958	4881	4903	4845	4895	4951	5069	5228	5193	5271
42	5191	5199	5247	5158	5089	5087	4936	4932	4872	4818	4762	4888	4836	4920	5088	5074	5191
43	5018	5083	5127	4971	4914	4931	4848	4830	4771	4698	4682	4777	4854	4789	4906	4895	5018
44	4889	4925	4904	4864	4876	4835	4754	4722	4667	4603	4606	4604	4702	4716	4787	4836	4889
45	4870	4804	4851	4796	4832	4807	4657	4559	4566	4415	4454	4489	4511	4649	4680	4833	4870
46	4810	4750	4753	4774	4685	4696	4529	4446	4428	4316	4331	4418	4423	4545	4610	4657	4810
47	4659	4636	4685	4605	4553	4554	4455	4377	4315	4229	4276	4240	4336	4378	4468	4573	4659
48	4556	4516	4509	4497	4502	4394	4331	4131	4141	4044	4081	4127	4173	4286	4354	4512	4556
49	4474	4418	4427	4435	4381	4292	4147	3975	3876	3828	3848	3905	4026	4169	4248	4392	4474
50	4326	4316	4293	4321	4235	4062	3901	3753	3677	3591	3593	3683	3783	4011	4144	4215	4326
51	4154	4153	4152	4125	4048	3851	3683	3510	3444	3359	3378	3474	3516	3732	3859	4082	4154
52	3958	3989	3948	3899	3816	3634	3446	3291	3211	3127	3163	3248	3319	3441	3612	3789	3958
53	3713	3734	3726	3661	3558	3390	3209	3072	2978	2896	2948	3021	3178	3253	3403	3584	3713
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55	3283	3301	3288	3265	3092	2904	2745	2655	2590	2552	2573	2642	2730	2845	2955	3150	3283
56	2990	3076	3029	3009	2859	2677	2584	2507	2460	2434	2415	2505	2548	2646	2806	2876	2990
57	2792	2791	2811	2738	2659	2551	2445	2332	2310	2252	2258	2314	2435	2475	2600	2681	2792
58	2611	2673	2587	2564	2544	2404	2295	2208	2168	2138	2108	2169	2255	2316	2400	2513	2611
59	2494	2499	2448	2418	2388	2275	2172	2092	2083	1978	2001	2062	2111	2188	2270	2396	2494
60	2338	2343	2322	2266	2233	2140	2038	1999	1957	1860	1913	1979	1982	2092	2144	2226	2338

61	2197	2212	2193	2143	2122	2026	1934	1849	1771	1707	1751	1835	1894	1973	2023	2130	2197
62	2080	2075	2068	2066	2017	1884	1766	1716	1664	1646	1682	1697	1737	1898	1949	2012	2080
63	1964	1929	1961	1944	1823	1723	1694	1644	1627	1591	1602	1661	1663	1723	1808	1916	1964
64	1795	1809	1817	1767	1701	1684	1617	1566	1521	1503	1500	1568	1591	1655	1712	1730	1795
65	1704	1728	1729	1686	1640	1592	1525	1467	1444	1419	1423	1498	1495	1590	1616	1662	1704
66	1614	1647	1641	1607	1558	1518	1458	1395	1373	1351	1365	1390	1442	1490	1521	1594	1614
67	1525	1567	1553	1528	1481	1435	1376	1336	1301	1275	1286	1328	1365	1427	1432	1519	1525
68	1466	1477	1471	1446	1407	1346	1287	1272	1250	1204	1220	1254	1276	1345	1373	1430	1466
69	1399	1398	1411	1376	1330	1278	1228	1200	1171	1156	1152	1191	1204	1272	1302	1364	1399
70	1309	1333	1325	1305	1253	1214	1165	1137	1116	1110	1108	1125	1149	1194	1234	1287	1309
71	1230	1252	1255	1234	1189	1151	1112	1099	1073	1075	1062	1075	1104	1141	1180	1203	1230
72	1166	1178	1194	1171	1129	1098	1070	1052	1023	1031	1022	1029	1057	1093	1116	1146	1166
73	1107	1126	1134	1114	1083	1057	1026	1007	971	980	980	983	1007	1044	1069	1090	1107
74	1054	1078	1083	1066	1034	1009	989	969	934	937	938	939	960	991	1026	1034	1054
75	998	1021	1044	1024	989	959	950	925	901	896	894	895	917	943	978	984	998
76	945	970	1004	984	947	929	907	886	859	853	850	851	871	896	926	934	945
77	893	920	954	934	914	896	869	849	815	811	805	807	828	850	882	890	893
78	847	878	909	894	876	859	840	809	772	767	756	765	786	805	836	847	847
79	799	835	866	854	844	824	799	764	726	715	709	717	736	761	789	799	799
80	755	782	826	823	807	791	755	718	679	662	661	664	686	710	739	750	755
81	712	740	785	783	768	748	713	669	626	607	608	614	633	661	690	700	712
82	655	689	730	737	724	704	664	614	570	548	546	561	578	610	636	645	655
83	602	631	677	691	677	656	611	555	509	480	484	504	517	555	578	583	602
84	539	571	618	638	627	604	548	481	433	407	412	435	454	496	512	521	539
85	472	504	556	582	566	533	465	392	347	322	329	363	388	434	447	454	472
86	401	432	483	513	496	450	374	297	264	244	256	284	309	357	379	384	401
87	327	348	396	423	402	351	273	206	185	172	190	220	235	271	286	300	327
88	239	261	297	309	282	238	174	133	125	118	126	158	171	193	202	215	239
89	168	177	190	182	158	134	114	99	98	96	97	104	108	126	140	153	168
90	126	128	132	125	108	93	84	76	85	84	85	87	82	87	97	105	126
91	43	40	84	84	74	75	69	32	56	54	75	80	73	70	56	20	43
92	5	4	24	52	59	59	31	3	3	4	44	63	60	50	21	4	5

93	3	4	4	20	31	21	4	4	3	4	6	38	36	24	4	3	3
94	4	7	4	4	4	4	4	16	6	9	5	6	8	4	4	13	4
95	57	51	4	4	3	4	5	65	54	67	6	5	3	4	5	58	57
96	66	51	9	4	4	5	11	104	135	115	12	6	5	4	12	57	66
97	63	45	17	7	8	9	21	107	135	107	24	8	9	7	20	54	63
98	60	40	17	17	16	19	38	92	119	96	38	18	17	18	18	48	60
99	52	32	16	34	38	40	42	80	103	79	41	47	44	40	15	35	52
100	36	24	16	68	75	77	37	66	88	64	36	78	93	77	13	25	36
101	25	18	21	121	137	113	36	58	78	56	34	111	140	113	17	18	25
102	16	13	30	168	192	147	42	49	65	46	38	145	179	147	24	12	16
103	10	9	47	203	236	181	47	38	49	35	46	177	220	179	35	8	10
104	6	8	60	220	269	190	55	31	39	28	54	190	245	190	46	7	6
105	5	10	74	228	266	192	63	25	29	24	62	197	249	199	58	8	5
106	5	12	86	231	268	200	71	21	23	21	74	204	249	205	68	10	5
107	6	17	95	235	266	207	80	20	18	19	83	213	252	211	78	13	6
108	6	21	104	240	265	216	87	19	13	19	93	220	257	224	86	16	6
109	7	26	115	251	270	223	96	21	9	20	101	221	254	232	96	18	7
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111	9	35	131	255	260	231	107	28	8	27	115	229	249	238	112	27	9
112	10	40	138	255	258	237	112	32	8	32	119	225	247	240	120	31	10
113	12	44	144	256	255	238	116	35	9	35	123	224	244	237	125	36	12
114	14	51	147	251	253	236	119	38	11	39	124	220	239	236	131	41	14
115	17	57	154	250	248	233	124	43	12	42	129	219	237	234	132	46	17
116	20	63	157	244	244	233	131	46	14	46	134	219	235	232	136	51	20
117	23	66	159	243	245	236	136	49	16	50	136	220	235	233	143	54	23
118	27	70	167	245	247	240	141	52	19	53	138	220	235	233	147	58	27
119	30	74	174	247	248	238	146	54	22	56	141	222	234	234	152	62	30
120	34	81	178	248	246	232	153	57	25	58	147	225	234	234	155	66	34
121	37	84	182	244	243	232	157	63	27	61	149	224	232	233	163	71	37
122	38	88	189	244	243	231	157	68	27	65	155	223	232	231	169	76	38
123	26	93	192	244	241	233	158	72	21	68	163	219	233	228	175	83	26
124	16	98	196	241	239	234	161	77	13	72	168	219	230	226	180	89	16

125	32	106	202	242	235	234	168	83	24	76	174	220	230	222	186	95	32
126	61	113	207	238	237	234	176	87	46	80	175	219	229	220	191	101	61
127	66	120	215	239	236	233	180	88	50	83	168	216	228	219	194	109	66
128	68	128	212	240	233	229	184	91	55	87	163	215	232	219	193	116	68
129	74	132	206	238	234	221	185	96	60	90	159	216	239	221	190	121	74
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131	80	147	207	232	230	204	169	96	67	93	156	208	235	228	183	133	80
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136	104	119	159	171	160	154	127	87	69	79	115	140	144	155	144	105	104
137	100	111	148	160	147	146	123	82	64	73	108	130	134	145	135	90	100
138	94	102	134	149	140	137	116	76	55	66	101	122	126	136	125	81	94
139	87	94	123	139	134	128	106	67	46	57	90	113	120	127	117	75	87
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141	72	73	109	118	117	106	84	52	26	40	73	93	103	107	101	60	72
142	59	58	99	106	105	93	73	45	18	35	65	83	92	96	91	47	59
143	41	52	89	95	91	82	66	43	20	32	60	75	83	84	80	41	41
144	28	56	78	83	80	73	61	44	25	32	56	70	76	75	71	45	28
145	35	53	70	76	73	67	58	41	30	33	54	66	70	68	65	46	35
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150	48	42	53	55	55	52	46	34	36	29	44	52	54	53	51	29	48
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159	32	28	31	33	31	31	28	24	22	23	18	22	28	26	22	24	32
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161	30	26	28	29	29	28	24	22	20	21	17	19	24	21	20	25	30
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163	27	25	26	26	27	25	22	20	18	19	16	17	21	20	20	23	27
164	26	24	25	25	25	24	20	19	17	18	15	16	20	19	20	23	26
165	25	24	24	23	24	23	19	17	16	17	15	14	19	19	19	22	25
166	23	23	23	22	22	22	19	16	15	16	14	14	18	18	19	21	23
167	23	23	22	21	21	21	18	15	15	16	16	14	18	17	19	20	23
168	22	23	21	20	20	20	17	15	16	16	16	15	18	17	19	20	22
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179	18	17	17	14	15	15	15	15	15	18	16	17	15	15	16	15	18
180	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17

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%			

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