



NVLAP Lab Code 500089-0

Report Number: PL06410-001A
Model: CPY250-A-xx-D-D-UL-40K-xxxx or
BXCCAxD17-Ux7xxxx
Date: 07/17/2015

Cree Racine Engineering Services Testing Laboratory (RESTL) Photometric Testing and Evaluation Report

Prepared For:

Christopher Strom

Cree, Inc.

9201 Washington Avenue

Racine, WI 53406

Prepared By:

Approved By:

Cedric Duviols, Photometric Test Technician

Christopher McLaurin, Photometric Specialist

Product Information

Manufacturer	Cree, Inc.
Model Number (SKU)	CPY250-A-xx-D-D-UL-40K-xxxx or BXCCAxD17-Ux7xxxx
Serial Number	PL06410-001
LED Type	XTE DA1150

Product Description

Cast white painted finned metal housing, molded white plastic reflector, 1 white circuit board with multiple LEDs, clear prismatic dome glass lens in cast white painted metal frame.

Driver Information (Where Applicable)

Philips LEDINTA0700C210D0

Length	Width	Height
15.0"	15.0"	3.25"

Sample

The following sample was submitted for evaluation





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Key Photometric Data	Sphere Output	Goniophotometer	
Luminous Flux	17516.2	17483.0	lm
Efficacy	116.99	116.97	lm/W
Correlated Color Temperature (CCT)	3939	K	
Color Rendering Index (CRI)	71		
R ₉	-18		
Duv	0.00043647		
S/P Ratio*	1.44		

Electrical Measurements	Sphere		Goniophotometer		
	120V	277V	120V	277V	
Input Wattage	149.73	147.49	149.47	147.21	W
Input Current	1.25	0.55	1.25	0.55	A
Input Voltage	119.98	276.98	120.04	276.95	V
Power Factor	0.998	0.971	0.996	0.969	
Off-State Power	0	0	0	0	W
Total Harmonic Distortion (Voltage)	0.04	0.06	0.07	0.06	%
Total Harmonic Distortion (Amperage)	4.00	9.31	4.12	9.56	%

Note: All photometric measurements taken at 120VAC.

Luminous Intensity Distribution	Goniophotometer	
Max Candela	7346.0	Cd
Angle of Max Candela (Horizontal)	0	°
Angle of Max Candela (Vertical)	5	°

Key Test Parameters	Sphere Output	Goniophotometer	
Stabilization Time	81	42	min
Total Operating Time (Stabilization + Test)	86	65	min
Ambient Temperature	24.5	24.8	°C

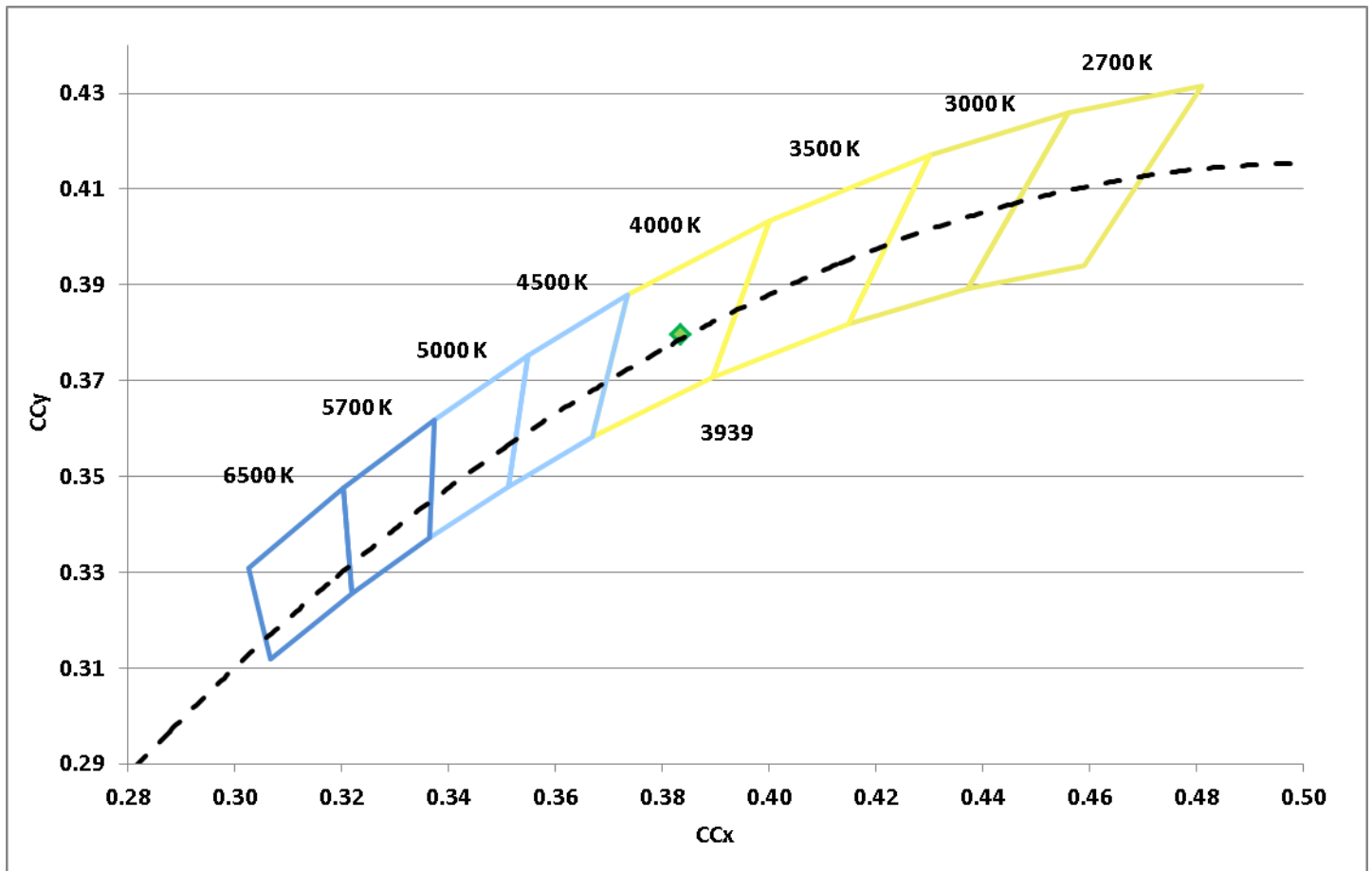
Chromaticity Coordinates

x	y	u	v	u'	v'	Duv
0.3835	0.3796	0.2260	0.3355	0.2260	0.5033	0.00043647

Color Rendering Index Details

Ra	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
71	70	75	79	72	69	65	79	57	-18	41	69	39	70	88

Chromaticity Diagram



Spectral Distribution

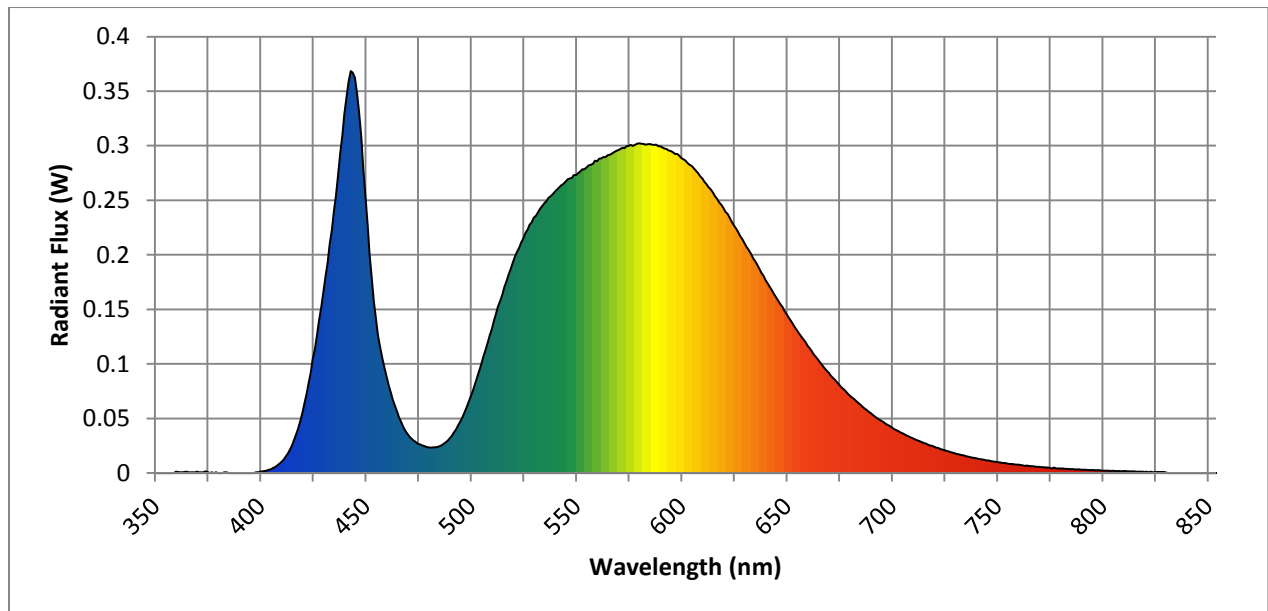
λ (nm)	W/nm
360	0.001299
370	0.001243
380	0.000447
390	0.000320
400	0.001229
410	0.009944
420	0.055209
430	0.164900
440	0.329196
450	0.253623
460	0.088302
470	0.035483
480	0.023653
490	0.031761
500	0.070144
510	0.132202
520	0.193460

λ (nm)	W/nm
530	0.234190
540	0.257946
550	0.273156
560	0.285874
570	0.296047
580	0.302118
590	0.299514
600	0.288609
610	0.270035
620	0.242580
630	0.210888
640	0.176839
650	0.145441
660	0.116632
670	0.091821
680	0.071205
690	0.054822

λ (nm)	W/nm
700	0.041733
710	0.031908
720	0.024055
730	0.018126
740	0.013583
750	0.010014
760	0.007602
770	0.005694
780	0.004180
790	0.003123
800	0.002187
810	0.001754
820	0.001068
830	0.000797

Dominant Wavelength	579	nm
Peak Wavelength	443	nm

Spectral Power Distribution (W/nm)



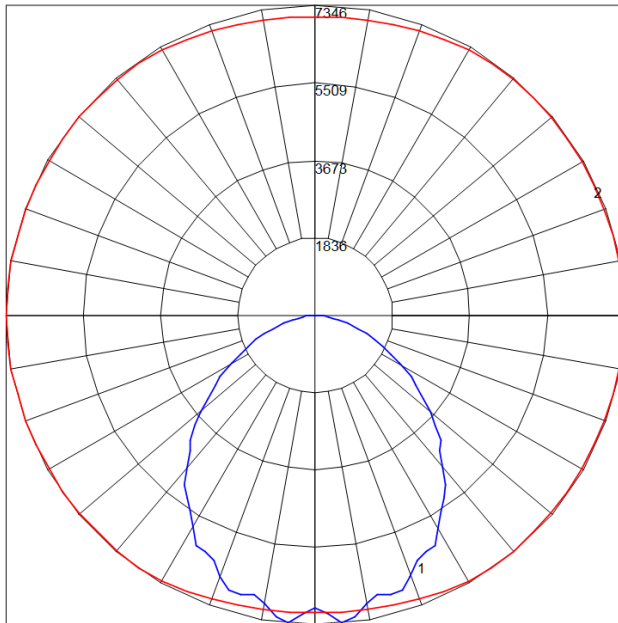


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Zonal Lumen Summary

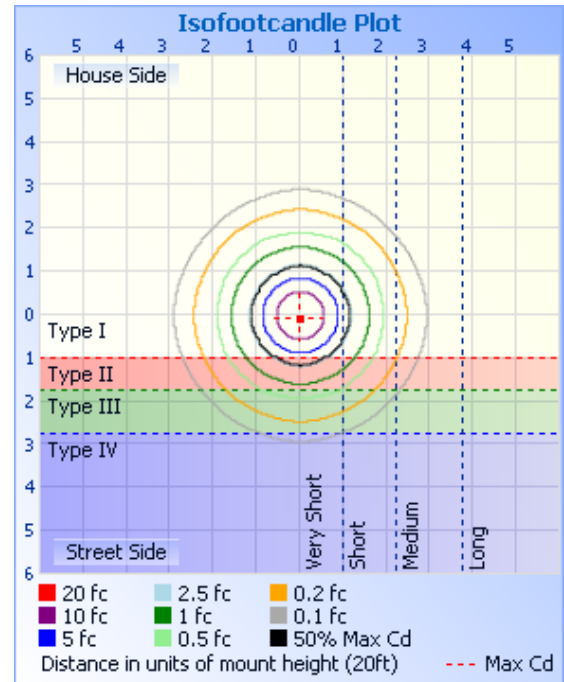
Zone	Lumens	% of Total	Zone	Lumens	% of Total
0-5	171.1	1.0%	90-95	42.3	0.2%
5-10	512.2	2.9%	95-100	19.2	0.1%
10-15	824.4	4.7%	100-105	10.1	0.1%
15-20	1,117.0	6.4%	105-110	4.4	0.0%
20-25	1,342.9	7.7%	110-115	1.1	0.0%
25-30	1,520.1	8.7%	115-120	0.2	0.0%
30-35	1,621.9	9.3%	120-125	0.0	0.0%
35-40	1,669.2	9.5%	125-130	0.0	0.0%
40-45	1,623.5	9.3%	130-135	0.0	0.0%
45-50	1,535.7	8.8%	135-140	0.0	0.0%
50-55	1,394.3	8.0%	140-145	0.0	0.0%
55-60	1,228.1	7.0%	145-150	0.0	0.0%
60-65	1,002.3	5.7%	150-155	0.0	0.0%
65-70	754.0	4.3%	155-160	0.0	0.0%
70-75	520.6	3.0%	160-165	0.0	0.0%
75-80	309.4	1.8%	165-170	0.0	0.0%
80-85	169.3	1.0%	170-175	0.0	0.0%
85-90	89.5	0.5%	175-180	0.0	0.0%
			Total	17483.0 lm	100%

Candela Plot

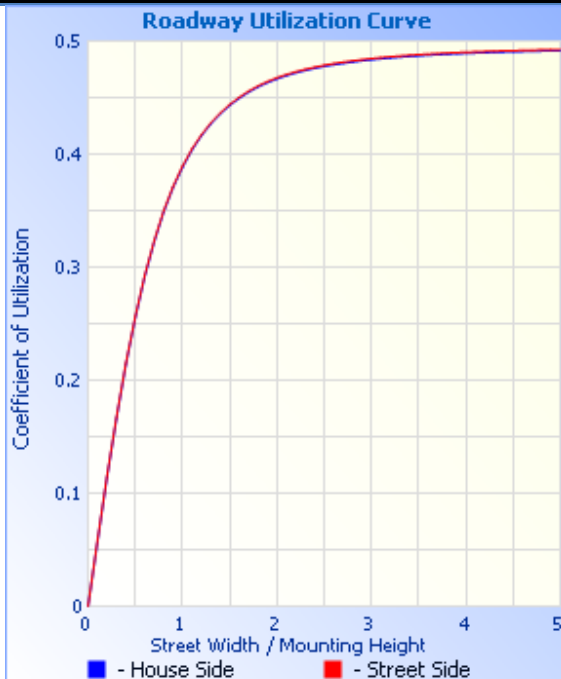


Maximum Candela = 7345.99 Located At Horizontal Angle = 0, Vertical Angle = 5
 # 1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
 # 2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)

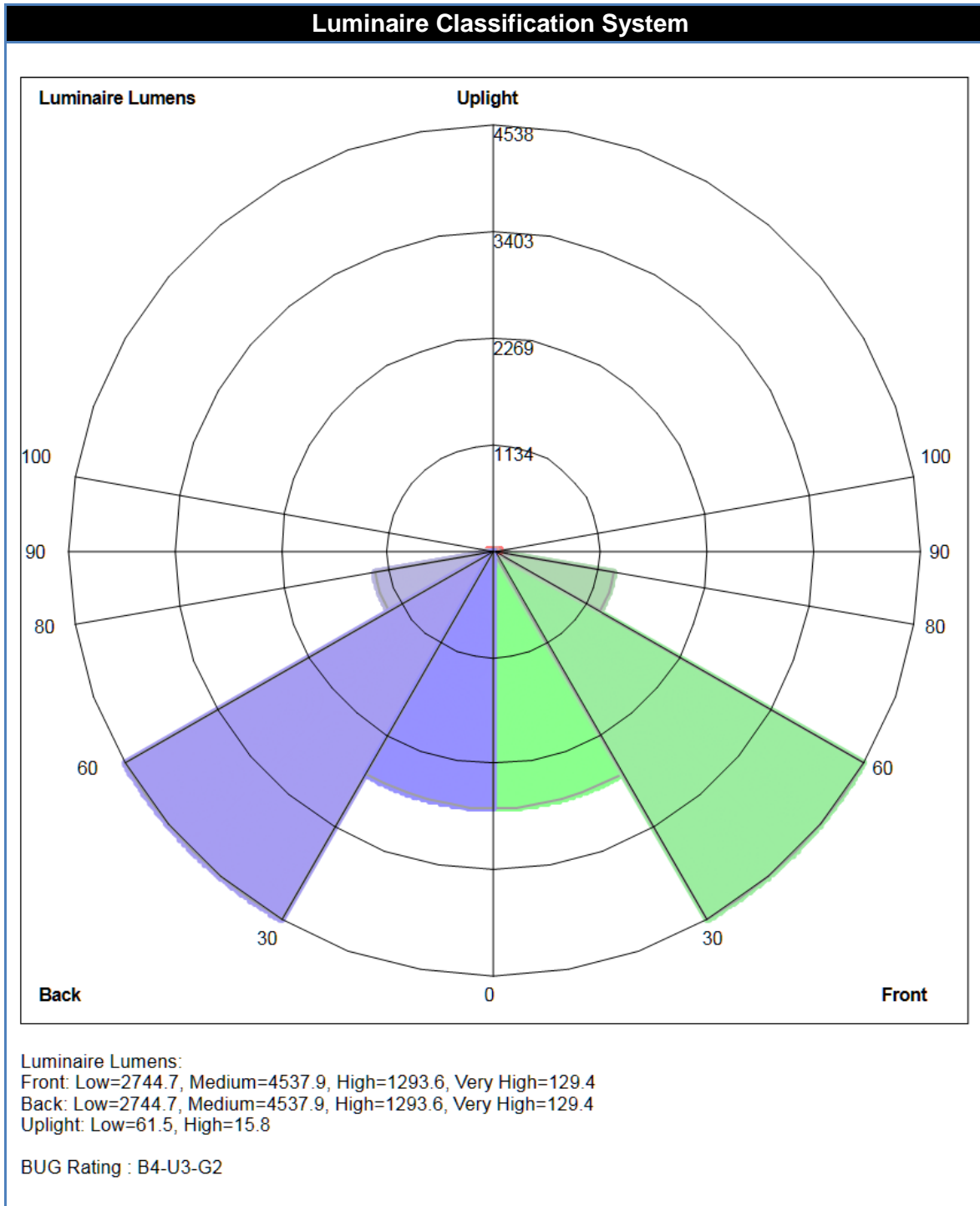
Illuminance Plot



Roadway Utilization



Roadway Summary	Lumens	% Lamp
Cutoff Classification	CUTOFF	
Distribution	Type VS	
Downward Street Side	8,703.5	49.8%
Downward House Side	8,703.5	49.8%
Downward Total	17,407.1	99.6%
Upward Street Side	38.6	0.2%
Upward House Side	38.6	0.2%
Upward Total	77.2	0.4%
Total Lumens	17,484.3	100%





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Candela Tabulations

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944
2.5	7116	7114	7110	7108	7106	7103	7099	7097	7095	7088	7084	7087	7085	7077	7072	7072	7066	7065	7063
5	7346	7337	7335	7328	7322	7319	7312	7312	7315	7318	7323	7321	7281	7235	7185	7139	7101	7086	7076
7.5	7217	7205	7208	7221	7224	7217	7210	7233	7277	7295	7277	7257	7243	7231	7209	7171	7130	7111	7109
10	6963	6964	6956	6972	6976	6964	6978	7031	7054	7013	7004	7035	7084	7110	7085	7026	6957	6928	6923
12.5	6792	6792	6827	6915	6950	6891	6874	6905	6941	6972	6984	7003	7073	7138	7120	7032	6908	6813	6777
15	6874	6905	6951	7038	7101	6991	6901	6795	6762	6798	6838	6874	6919	7008	7066	7081	6988	6807	6724
17.5	6863	6858	6825	6873	6911	6855	6836	6737	6677	6630	6652	6650	6739	6860	6837	6825	6880	6833	6797
20	6605	6577	6539	6517	6597	6667	6710	6745	6687	6648	6582	6558	6633	6709	6611	6609	6661	6629	6573
22.5	6307	6353	6412	6371	6367	6398	6423	6420	6525	6596	6479	6404	6446	6424	6350	6397	6472	6353	6164
25	6210	6196	6232	6233	6214	6094	6126	6149	6273	6427	6318	6167	6102	6066	6112	6184	6227	6197	6063
27.5	6169	6103	6127	6078	6106	5967	5954	6009	5982	6021	5991	5997	5935	5859	5979	6054	6114	6107	5994
30	5828	5824	5767	5886	5929	5866	5786	5802	5753	5705	5655	5818	5820	5751	5808	5828	5835	5831	5810
32.5	5537	5489	5424	5504	5506	5512	5628	5545	5435	5413	5393	5520	5626	5536	5501	5496	5434	5522	5513
35	5309	5316	5365	5308	5220	5190	5238	5212	5282	5169	5205	5230	5258	5166	5184	5223	5317	5315	5305
37.5	5101	5154	5179	5088	5010	5005	5025	4905	4948	4966	4982	4896	4935	4987	5034	5016	5230	5175	5115
40	4713	4692	4739	4733	4794	4772	4698	4618	4618	4627	4668	4606	4706	4832	4774	4724	4744	4676	4791
42.5	4379	4384	4358	4338	4280	4367	4368	4375	4471	4379	4469	4428	4346	4366	4272	4391	4371	4400	4435
45	4197	4218	4142	4103	4045	4031	3927	4058	4144	4125	4179	4048	3982	4115	4053	4066	4115	4204	4137
47.5	3867	3880	3876	3818	3828	3767	3720	3748	3791	3807	3752	3782	3723	3742	3851	3838	3880	3841	3871
50	3570	3510	3545	3497	3514	3458	3455	3561	3519	3427	3507	3545	3531	3430	3518	3459	3548	3570	3558
52.5	3237	3216	3222	3158	3170	3163	3214	3255	3134	3204	3157	3229	3176	3184	3208	3162	3208	3238	3225
55	2907	2907	2906	2888	2918	2900	2942	2908	2913	2957	2880	2899	2991	2902	2965	2969	3033	3037	3018
57.5	2703	2677	2652	2623	2614	2628	2654	2621	2673	2601	2683	2646	2681	2695	2670	2640	2709	2708	2741
60	2294	2313	2369	2432	2438	2377	2298	2366	2362	2338	2379	2386	2362	2433	2424	2427	2409	2367	2337
62.5	2013	2019	2027	2029	2056	2127	2137	2065	2024	2089	2052	2097	2102	2130	2044	2025	2023	2019	2032
65	1780	1765	1732	1704	1716	1756	1771	1803	1787	1775	1789	1781	1794	1760	1731	1722	1728	1752	1758
67.5	1532	1506	1497	1490	1480	1472	1456	1472	1507	1512	1488	1460	1456	1456	1464	1500	1511	1525	1535
70	1286	1261	1247	1239	1200	1211	1213	1219	1190	1184	1190	1195	1211	1224	1217	1262	1275	1289	1313
72.5	1053	1041	1028	1014	988	987	978	976	934	935	944	967	976	982	978	1002	1021	1039	1036
75	789	790	801	806	790	785	774	769	743	752	737	765	768	779	778	778	789	789	791
77.5	548	556	553	552	555	564	573	583	573	576	576	583	571	563	554	553	556	556	559
80	405	403	400	401	405	409	413	417	423	422	419	417	416	413	409	404	404	405	405
82.5	300	301	302	302	302	305	308	310	314	315	315	311	309	308	305	301	302	302	300
85	217	220	221	221	222	224	226	226	229	232	230	228	225	226	223	221	223	221	220
87.5	151	155	155	156	157	157	159	160	161	164	163	162	160	160	159	158	159	158	156
90	103	105	107	107	108	109	111	113	114	116	116	116	115	115	114	114	113	112	111



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Candela Tabulations (Continued)

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
92.5	60	61	60	60	61	62	65	68	71	75	78	80	83	85	87	88	89	90	89
95	30	30	29	28	28	30	34	37	41	46	51	55	60	64	68	71	74	77	77
97.5	8	8	8	7	5	7	12	18	24	31	38	44	50	55	59	64	68	71	71
100	0	0	0	0	0	0	2	8	15	21	27	33	39	45	50	55	59	62	63
102.5	0	0	0	0	0	0	0	2	6	13	19	25	30	35	40	44	47	50	51
105	0	0	0	0	0	0	0	0	1	5	9	16	21	26	31	34	36	38	39
107.5	0	0	0	0	0	0	0	0	0	0	3	7	11	16	20	23	26	27	27
110	0	0	0	0	0	0	0	0	0	0	0	0	2	6	10	14	16	18	18
112.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	8	10	11
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	6	7
117.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	3	4
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
122.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
167.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Integrating Sphere Equipment List

Description	Manufacturer	Model	Serial Number
2M Sphere	Everfine	2M	1004156T
CCD Array Spectrometer	Labsphere	MC-9801	98010360
Programmable AC Source	Adaptive	FC200	2280220
Power Analyzer	Yokogawa	WT310	C2QC04045V

Goniophotometer Equipment List

Description	Manufacturer	Model	Serial Number
AC Power Source	Chroma	61602	616020002300
Type C Goniophotometer	LSI / UL	6440T	6440PN2028
Spectroradiometer	Gooch & Housego	770VIS/NIR	12415212
Power Meter	Yokogawa	WT210	91M945458

Test Methods Used:

Title	Description
ANSI C82.77:2002	Harmonic Emission Limits- Related Power Quality Reqt's for Lighting Equipment
CIE Pub. 13.3:1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. 15:2004	Colorimetry
IES LM-58:1994	Spectroradiometric Measurements
IES LM-65:2001	Single-Ended Compact Fluorescent Lamps – Life Test Performance
IES LM-79:2008	Electrical and Photometric Measurements of Solid-State Lighting Products

Reference Standard Used:

Equipment	Description
2m Sphere	Tungsten Halogen Omni-Directional 75W Calibration Lamp, Serial Number F119
Type C Goniophotometer and Spectrometer	Tungsten Halogen Omni-Directional 500W Calibration Lamp, Serial Numbers 13C069, 13C070, 13C071. For color calibration of spectrometer, 13C074.

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The results contained in this report pertain only to the tested sample.

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Items marked with a single asterisk are not covered by the NVLAP accreditation.

In the event that the recorded temperature is outside of $25 \pm 1^{\circ}\text{C}$, this is considered a non-standard condition.

** In the event that testing is subcontracted, test results in this report marked with the symbol **, or noted as “Sphere” or “Integrating Sphere”, were performed by the subcontracted laboratory identified in the footer on the first page of this report. Subcontracted testing is strictly integrating sphere based. All other tests are performed using a Type C goniophotometer.

The integrating sphere information in the equipment list, report items marked with **, or results specifically identified as “Sphere” or “Integrating Sphere”, are the actual equipment used, and test results produced, by the subcontracted laboratory when subcontracting is indicated on the cover page.

Additional Comments:

The photos below are intended to show the orientation and fixturing/set-up of the units under test. These are critical to understanding the results of the test given the sensitivity of many products and measurement systems to orientation and set-up considerations, and also for reproducing the conditions of the test.

Goniophotometer



Integrating Sphere





NVLAP Lab Code 500089-0

Document Revision History:

Each subsequent revision of this report replaces the preceding report.

Date	Rev	DCN #	Change at the time of this test	By	Approval
07/17/15	A	DMS	Origination	C. Duviols	C. McLaurin