7036 Snowdrift Road Suite 200
Allentown, PA 18106
610-774-1300

Integrating Sphere Test Report

Relevant Standards
IES LM-79-2008
ANSI C78.377-2011, ANSI C82.77-2002
CIE 13.3-1995, CIE 15-2004

Prepared For
Lighting Science Group Corporation
Ivars Lauzums
1227 South Patrick Dr.
Satellite Beach, FL 32937-3970

Catalog Number
xxx G25 25WE W27 120 CB BX

Order Number
10151501
Test Number
432168

Test Date

2013-12-18

Prepared By

Jeff Smith Jr., Project Handler

Approved By

Jeffrey Lockner, Engineer

7036 Snowdrift Road Suite 200
Allentown, PA 18106
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Lamp Description:	Formed white plastic housing, aluminum heatsinks, frosted plastic enclosure
Catalog Number:	xxx G25 25WE W27 120 CB BX
Lamp:	One white LED array
Mounting:	VBU

Lamp

Summary of Results

Radiant Flux:	919.7	mW
Luminous Flux:	295.7	Lumens
Lamp Efficacy:	77.0	Lumens/Watt
CCT:	2698	K
CRI (Ra):	80.5	
Chromaticity (x):	0.4622	
Chromaticity (y):	0.4148	
Chromaticity (u):	0.2621	
Chromaticity (v):	0.3529	
Duv:	0.0010	

Test Conditions

Test Temperature:	25.3	°C
Voltage:	120.0	VAC
Current:	0.03997	A
Power:	3.839	W
Power Factor:	0.800	
Frequency:	60	Hz
Current THD:	47.7	%

Testing was performed in a 1-meter integrating sphere using the 4π geometry method.

Absorption correction was employed for this measurement.

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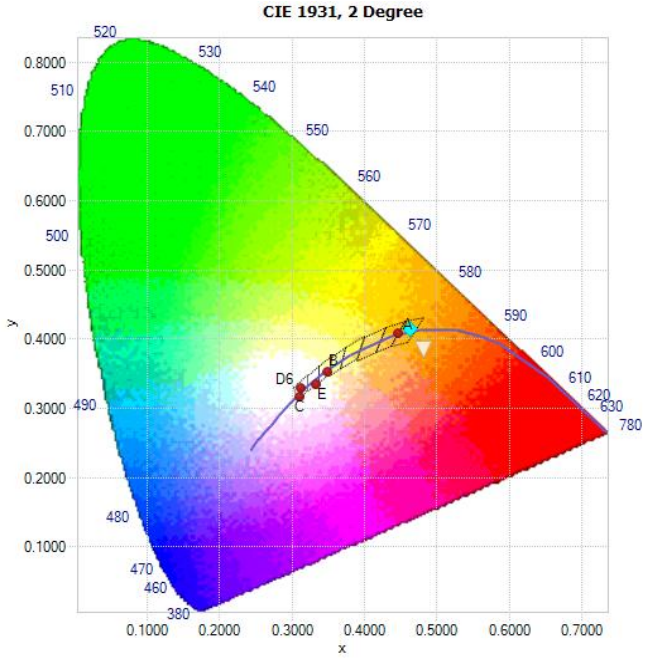
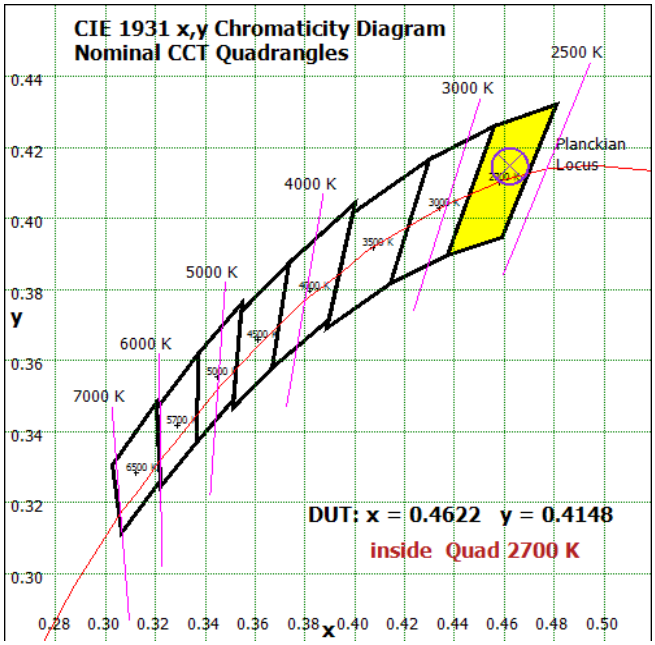
Chromaticity Coordinates

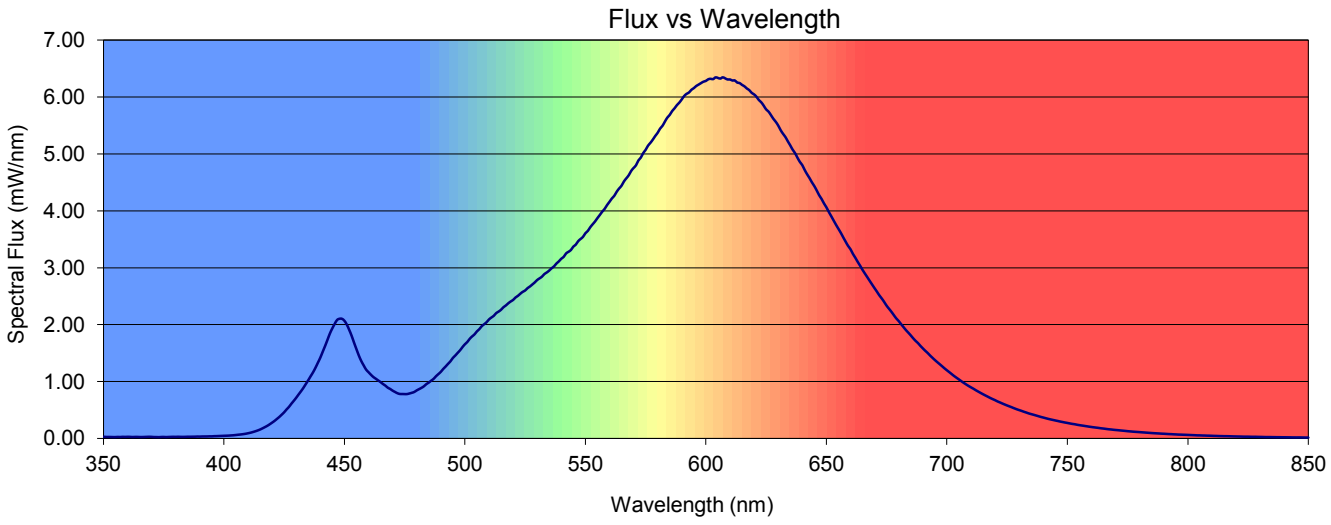
x	y	u	v	u'	v'	Duv
0.4622	0.4148	0.2621	0.3529	0.2621	0.5293	0.0010

Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
80.5	78.0	88.6	97.2	78.1	77.8	86.1	82.3	56.3	3.2	74.6	76.3	70.6	80.0	98.7







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Spectral Power Distribution

λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm	λ(nm)	mW/nm
350	0.0318	422	0.344	494	1.36	566	4.52	638	4.93	710	0.899	782	0.106
351	0.0276	423	0.379	495	1.41	567	4.57	639	4.86	711	0.875	783	0.103
352	0.0274	424	0.419	496	1.46	568	4.63	640	4.80	712	0.849	784	0.0993
353	0.0267	425	0.460	497	1.50	569	4.70	641	4.72	713	0.825	785	0.0959
354	0.0253	426	0.510	498	1.55	570	4.75	642	4.64	714	0.801	786	0.0933
355	0.0252	427	0.555	499	1.61	571	4.80	643	4.58	715	0.778	787	0.0908
356	0.0277	428	0.611	500	1.65	572	4.88	644	4.50	716	0.756	788	0.0886
357	0.0261	429	0.662	501	1.70	573	4.93	645	4.43	717	0.734	789	0.0857
358	0.0297	430	0.716	502	1.75	574	5.01	646	4.36	718	0.712	790	0.0837
359	0.0282	431	0.774	503	1.79	575	5.07	647	4.27	719	0.692	791	0.0810
360	0.0302	432	0.831	504	1.83	576	5.14	648	4.21	720	0.673	792	0.0782
361	0.0289	433	0.890	505	1.88	577	5.19	649	4.13	721	0.652	793	0.0767
362	0.0264	434	0.958	506	1.92	578	5.25	650	4.06	722	0.634	794	0.0741
363	0.0275	435	1.02	507	1.97	579	5.32	651	3.98	723	0.615	795	0.0720
364	0.0283	436	1.09	508	2.01	580	5.37	652	3.91	724	0.598	796	0.0691
365	0.0262	437	1.16	509	2.04	581	5.44	653	3.83	725	0.580	797	0.0682
366	0.0258	438	1.24	510	2.09	582	5.49	654	3.76	726	0.564	798	0.0664
367	0.0274	439	1.33	511	2.13	583	5.57	655	3.68	727	0.547	799	0.0652
368	0.0290	440	1.42	512	2.16	584	5.64	656	3.61	728	0.530	800	0.0632
369	0.0304	441	1.52	513	2.20	585	5.69	657	3.53	729	0.514	801	0.0614
370	0.0289	442	1.63	514	2.23	586	5.75	658	3.46	730	0.499	802	0.0595
371	0.0257	443	1.74	515	2.26	587	5.80	659	3.38	731	0.485	803	0.0574
372	0.0254	444	1.85	516	2.31	588	5.86	660	3.33	732	0.470	804	0.0553
373	0.0240	445	1.94	517	2.34	589	5.90	661	3.24	733	0.456	805	0.0547
374	0.0265	446	2.02	518	2.38	590	5.96	662	3.18	734	0.441	806	0.0528
375	0.0278	447	2.08	519	2.41	591	6.02	663	3.10	735	0.429	807	0.0518
376	0.0252	448	2.10	520	2.43	592	6.05	664	3.04	736	0.417	808	0.0503
377	0.0272	449	2.10	521	2.48	593	6.08	665	2.96	737	0.405	809	0.0494
378	0.0284	450	2.07	522	2.51	594	6.13	666	2.90	738	0.392	810	0.0476
379	0.0298	451	2.00	523	2.54	595	6.15	667	2.83	739	0.379	811	0.0458
380	0.0288	452	1.91	524	2.58	596	6.19	668	2.77	740	0.369	812	0.0449
381	0.0308	453	1.81	525	2.60	597	6.22	669	2.70	741	0.357	813	0.0429
382	0.0292	454	1.69	526	2.64	598	6.24	670	2.64	742	0.346	814	0.0423
383	0.0286	455	1.57	527	2.67	599	6.27	671	2.58	743	0.336	815	0.0409
384	0.0297	456	1.46	528	2.71	600	6.28	672	2.51	744	0.327	816	0.0406
385	0.0313	457	1.36	529	2.74	601	6.31	673	2.46	745	0.317	817	0.0398
386	0.0310	458	1.28	530	2.78	602	6.32	674	2.40	746	0.308	818	0.0383
387	0.0319	459	1.21	531	2.81	603	6.31	675	2.33	747	0.298	819	0.0372
388	0.0325	460	1.17	532	2.84	604	6.34	676	2.28	748	0.290	820	0.0359
389	0.0346	461	1.12	533	2.89	605	6.33	677	2.23	749	0.281	821	0.0353
390	0.0337	462	1.08	534	2.92	606	6.32	678	2.17	750	0.273	822	0.0342
391	0.0358	463	1.05	535	2.95	607	6.34	679	2.11	751	0.265	823	0.0329
392	0.0359	464	1.02	536	2.99	608	6.33	680	2.06	752	0.257	824	0.0324
393	0.0364	465	0.992	537	3.02	609	6.31	681	2.01	753	0.251	825	0.0324
394	0.0382	466	0.958	538	3.07	610	6.31	682	1.96	754	0.242	826	0.0308
395	0.0378	467	0.929	539	3.11	611	6.29	683	1.91	755	0.235	827	0.0302
396	0.0410	468	0.893	540	3.16	612	6.29	684	1.86	756	0.228	828	0.0302
397	0.0419	469	0.870	541	3.19	613	6.25	685	1.81	757	0.222	829	0.0291
398	0.0440	470	0.841	542	3.25	614	6.24	686	1.76	758	0.215	830	0.0283
399	0.0459	471	0.818	543	3.28	615	6.21	687	1.72	759	0.209	831	0.0271
400	0.0476	472	0.796	544	3.31	616	6.19	688	1.68	760	0.202	832	0.0258
401	0.0492	473	0.783	545	3.37	617	6.15	689	1.63	761	0.197	833	0.0254
402	0.0513	474	0.782	546	3.40	618	6.12	690	1.58	762	0.191	834	0.0252
403	0.0542	475	0.780	547	3.47	619	6.07	691	1.54	763	0.186	835	0.0244
404	0.0571	476	0.781	548	3.50	620	6.04	692	1.50	764	0.179	836	0.0238
405	0.0619	477	0.791	549	3.54	621	6.00	693	1.46	765	0.175	837	0.0232
406	0.0668	478	0.803	550	3.61	622	5.95	694	1.42	766	0.169	838	0.0227
407	0.0710	479	0.818	551	3.65	623	5.91	695	1.38	767	0.163	839	0.0221
408	0.0769	480	0.845	552	3.71	624	5.85	696	1.34	768	0.159	840	0.0215
409	0.0833	481	0.868	553	3.76	625	5.78	697	1.31	769	0.154	841	0.0209
410	0.0925	482	0.890	554	3.81	626	5.74	698	1.27	770	0.150	842	0.0206
411	0.102	483	0.918	555	3.87	627	5.68	699	1.23	771	0.146	843	0.0197
412	0.113	484	0.955	556	3.93	628	5.62	700	1.20	772	0.142	844	0.0191
413	0.126	485	0.982	557	3.99	629	5.56	701	1.17	773	0.138	845	0.0188
414	0.141	486	1.02	558	4.03	630	5.50	702	1.13	774	0.134	846	0.0190
415	0.158	487	1.05	559	4.10	631	5.42	703	1.10	775	0.129	847	0.0185
416	0.178	488	1.09	560	4.16	632	5.35	704	1.07	776	0.125	848	0.0177
417	0.200	489	1.13	561	4.22	633	5.30	705	1.04	777	0.121	849	0.0169
418	0.223	490	1.17	562	4.26	634	5.22	706	1.01	778	0.118	850	0.0165
419	0.250	491	1.22	563	4.34	635	5.15	707	0.978	779	0.115		
420	0.279	492	1.26	564	4.39	636	5.07	708	0.951	780	0.112		
421	0.309	493	1.31	565	4.44	637	5.01	709	0.923	781	0.109		

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Photometric Indoor Test Report

Relevant Standards
IES LM-79-2008
ANSI C82.77-2002

Prepared For
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Ivars Lauzums
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Catalog Number
xxx G25 25WE W27 120 CB BX
Project Number
10151501
Test Number
432167

Test Date

2013-12-23

Prepared By

Jeff Smith Jr., Project Handler

Approved By

Jeffrey Lockner, Engineer

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Lamp Description:	Formed white plastic housing, aluminum heatsinks, frosted plastic enclosure
Catalog Number:	xxx G25 25WE W27 120 CB BX
Lamp:	One white LED array
Mounting:	VBU

Lamp

Test Conditions

Test Temperature:	24.1	°C
Voltage:	120.0	VAC
Current:	0.04001	A
Power:	3.844	W
Power Factor:	0.800	
Frequency:	60	Hz
Current THD:	47.5	%

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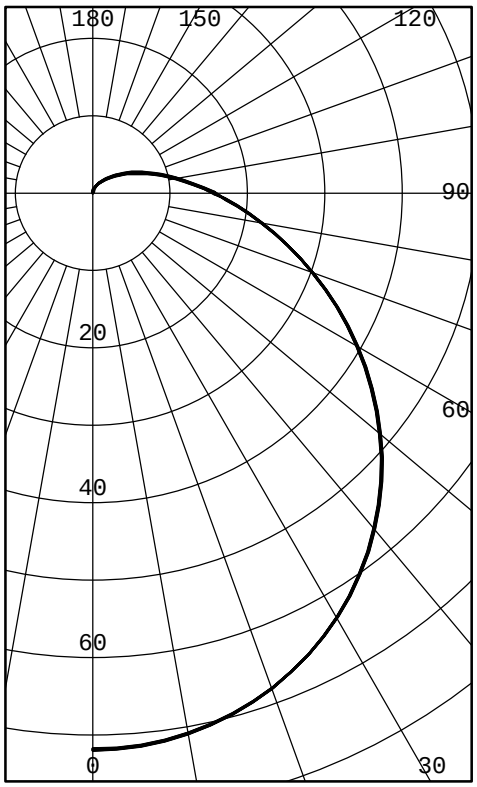
INTENSITY(CANDLEPOWER) SUMMARY



ANGLE	MEAN CP	LMS.	ANGLE	MEAN CP	LMS.
0	72		90	16	
5	72	7	95	13	14
10	71		100	11	
15	70	20	105	9	10
20	68		110	8	
25	66	30	115	6	6
30	63		120	5	
35	60	38	125	4	4
40	57		130	3	
45	53	41	135	3	2
50	48		140	2	
55	44	39	145	2	1
60	39		150	1	
65	35	34	155	1	1
70	30		160	1	
75	26	28	165	1	0
80	22		170	0	
85	19	21	175	0	0
90	16		180	0	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	57	19.26
0-40	94	31.98
0-60	174	59.05
0-90	257	87.02
40-90	163	55.04
60-90	83	27.97
90-180	38	12.98
0-180	295	100.00

EFFICACY (LUMENS PER WATT): 77.7

*** THIS IS AN ABSOLUTE TEST ***

LUMINOUS DIAMETER: 3.500 INS

LUMINANCE SUMMARY CD./SQ.M.

S/MH: 1.3
SC: 1.3

ANGLE	MEAN CD/SQ M
45	18930
55	13644
65	9757
75	6862
85	4782

TESTED IN ACCORDANCE WITH IES PROCEDURES.

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INTENSITY(CANDLEPOWER) DATA

ANGLE	INTENSITY (CANDLEPOWER)	LUMENS
0	72	
5	72	7
10	71	
15	70	20
20	68	
25	66	30
30	63	
35	60	38
40	57	
45	53	41
50	48	
55	44	39
60	39	
65	35	34
70	30	
75	26	28
80	22	
85	19	21
90	16	
95	13	14
100	11	
105	9	10
110	8	
115	6	6
120	5	
125	4	4
130	3	
135	3	2
140	2	
145	2	1
150	1	
155	1	1
160	1	
165	1	0
170	0	
175	0	0
180	0	

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COEFFICIENTS OF UTILIZATION

ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE = .20

CC WALL	90				80				70				50			30			10			0
RCR	70	50	30	10	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	1.20	1.20	1.20	1.20	1.16	1.16	1.16	1.16	1.12	1.12	1.12	1.12	1.04	1.04	1.04	0.97	0.97	0.97	0.90	0.90	0.90	0.87
1	1.08	1.02	0.96	0.92	1.04	0.98	0.93	0.89	1.00	0.95	0.90	0.86	0.88	0.84	0.81	0.82	0.79	0.76	0.76	0.74	0.72	0.69
2	0.98	0.88	0.80	0.73	0.94	0.85	0.78	0.71	0.90	0.82	0.75	0.70	0.76	0.71	0.66	0.71	0.67	0.63	0.66	0.63	0.59	0.56
3	0.89	0.77	0.68	0.60	0.85	0.74	0.66	0.59	0.82	0.72	0.64	0.58	0.67	0.60	0.55	0.62	0.57	0.52	0.58	0.54	0.50	0.47
4	0.82	0.68	0.58	0.51	0.78	0.66	0.57	0.50	0.75	0.64	0.56	0.49	0.60	0.53	0.47	0.56	0.50	0.45	0.52	0.47	0.43	0.40
5	0.75	0.60	0.51	0.43	0.72	0.59	0.49	0.43	0.69	0.57	0.48	0.42	0.53	0.46	0.40	0.50	0.43	0.39	0.47	0.41	0.37	0.34
6	0.69	0.54	0.44	0.38	0.66	0.52	0.43	0.37	0.63	0.51	0.42	0.36	0.47	0.40	0.35	0.45	0.38	0.33	0.42	0.36	0.32	0.30
7	0.63	0.48	0.39	0.33	0.60	0.47	0.38	0.32	0.58	0.45	0.37	0.31	0.43	0.35	0.30	0.40	0.33	0.29	0.38	0.32	0.28	0.25
8	0.58	0.44	0.35	0.28	0.56	0.42	0.34	0.28	0.54	0.41	0.33	0.27	0.39	0.31	0.26	0.36	0.30	0.25	0.34	0.29	0.24	0.22
9	0.54	0.40	0.31	0.25	0.52	0.38	0.30	0.24	0.50	0.37	0.29	0.24	0.35	0.28	0.23	0.33	0.27	0.22	0.31	0.26	0.21	0.19
10	0.50	0.36	0.27	0.22	0.48	0.35	0.27	0.21	0.46	0.34	0.26	0.21	0.32	0.25	0.20	0.30	0.24	0.20	0.29	0.23	0.19	0.17

THE ABOVE COEFFICIENTS HAVE BEEN CALCULATED BASED ON LUMINAIRE LUMENS
BECAUSE IN AN ABSOLUTE TEST THE BARE LAMP LUMENS ARE UNKNOWN.
LIGHTING DESIGN CALCULATIONS MADE USING THESE COEFFICIENTS SHOULD
THEREFORE USE THE LUMINAIRE LUMENS IN THE CALCULATION FORMULA

LABORATORY RESULTS MAY NOT BE REPRESENTATIVE OF FIELD PERFORMANCE.
BALLAST AND FIELD FACTORS HAVE NOT BEEN APPLIED.

TEST DISTANCE EXCEEDS FIVE TIMES THE GREATEST
LUMINOUS OPENING OF LUMINAIRE.