



UL Verification Services

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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

US Lighting Group LLC

Brian Hemphill

9348 Mercantile Dr.

Mentor, OH 44060

Catalog Number

BH4-110-45-C

Project Number

10052403

Test Number

293047

Test Date

2013-08-20

Prepared By

A handwritten signature in black ink that reads 'Tammy Lacey'.

Tammy Lacey, Administrative Assistant II

Approved By

A handwritten signature in black ink that reads 'Jeff A. Smith Jr.'.

Jeff Smith Jr., Project Coordinator

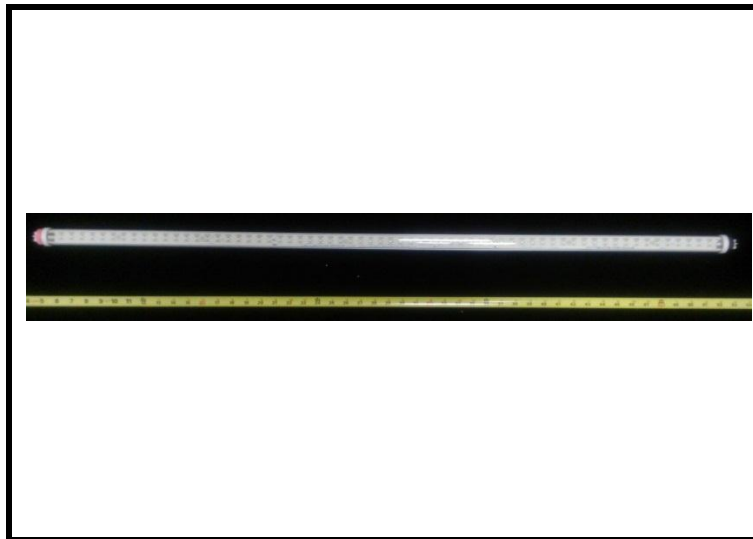
The results contained in this report pertain only to the tested sample.

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Luminaire Description: Aluminum heatsink, clear plastic enclosure
Catalog Number: BH4-110-45-C
Lamp: 64 white LEDs
Mounting: Horizontal

Luminaire



Summary of Results

Radiant Flux: 6524 mW
Luminous Flux: 2101 Lumens
Luminaire Efficacy: 106 Lumens/Watt
CCT: 3893 K
CRI (Ra): 82.8
Chromaticity (x): 0.3869
Chromaticity (y): 0.3856
Chromaticity (u): 0.2258
Chromaticity (v): 0.3376
Duv: 0.0021

Test Conditions

Test Temperature: 24.2 °C
Voltage: 110.0 VAC
Current: 0.1802 A
Power: 19.76 W
Power Factor: 0.997
Frequency: 60 Hz
Current THD: 6.77 %

Testing was performed in a 3-meter integrating sphere using the 4 π geometry method.

Absorption correction was employed for this measurement.

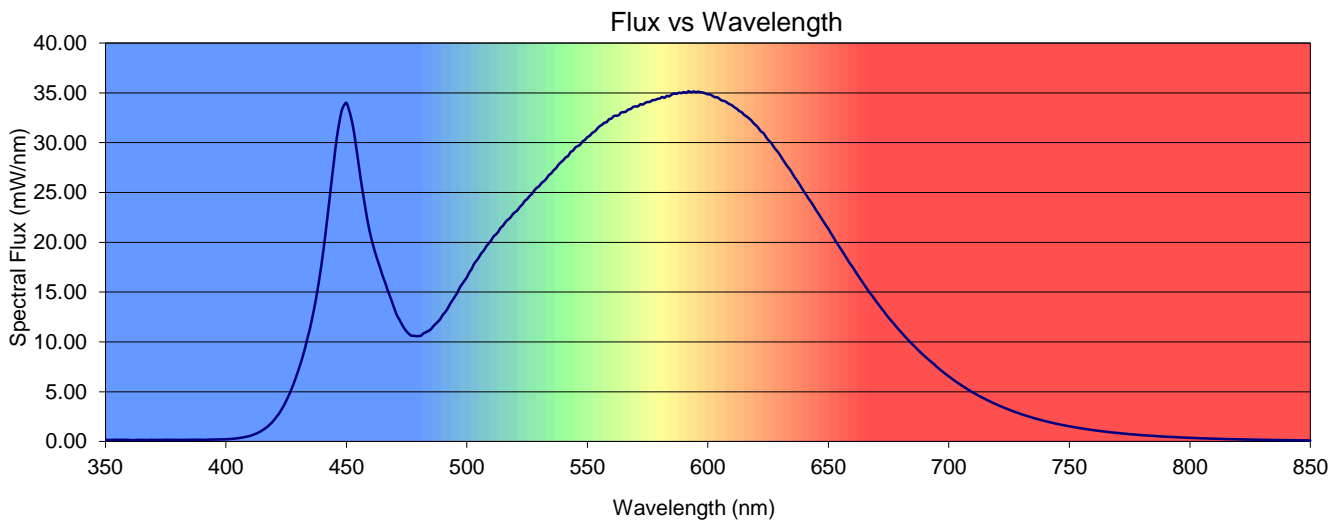
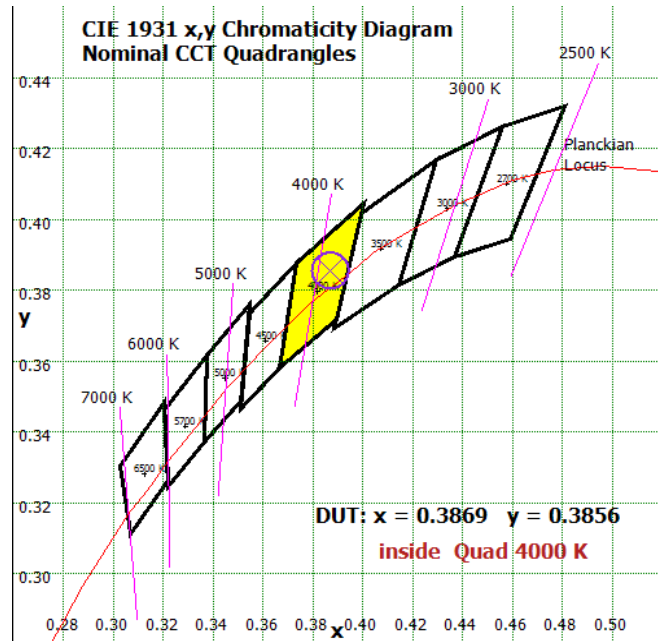
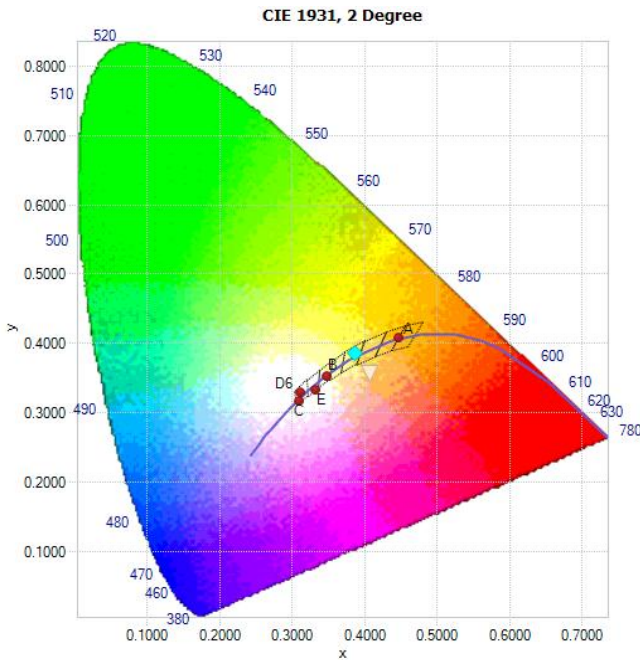


Chromaticity Coordinates

x	y	u	v	u'	v'	Duv
0.3869	0.3856	0.2258	0.3376	0.2258	0.5064	0.0021

Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
82.8	80.7	87.8	93.0	81.6	80.3	82.6	88.0	68.0	16.6	70.6	79.0	61.3	82.1	96.0





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	0.158	422	2.79	494	14.2	566	33.1	638	25.8	710	4.92	782	0.605
351	0.169	423	3.18	495	14.5	567	33.3	639	25.4	711	4.79	783	0.592
352	0.159	424	3.59	496	14.9	568	33.4	640	25.0	712	4.64	784	0.578
353	0.164	425	4.07	497	15.4	569	33.6	641	24.7	713	4.52	785	0.560
354	0.178	426	4.57	498	15.8	570	33.6	642	24.3	714	4.40	786	0.545
355	0.172	427	5.14	499	16.1	571	33.7	643	24.0	715	4.27	787	0.528
356	0.172	428	5.74	500	16.5	572	33.8	644	23.6	716	4.15	788	0.513
357	0.168	429	6.40	501	17.0	573	33.8	645	23.2	717	4.03	789	0.498
358	0.170	430	7.09	502	17.3	574	34.0	646	22.8	718	3.92	790	0.484
359	0.163	431	7.84	503	17.8	575	34.1	647	22.4	719	3.81	791	0.473
360	0.156	432	8.64	504	18.1	576	34.1	648	22.1	720	3.70	792	0.457
361	0.140	433	9.53	505	18.5	577	34.3	649	21.7	721	3.59	793	0.448
362	0.145	434	10.5	506	18.9	578	34.3	650	21.3	722	3.49	794	0.436
363	0.156	435	11.5	507	19.2	579	34.4	651	20.9	723	3.39	795	0.426
364	0.165	436	12.6	508	19.6	580	34.4	652	20.5	724	3.29	796	0.413
365	0.161	437	13.8	509	19.9	581	34.6	653	20.1	725	3.19	797	0.400
366	0.163	438	15.2	510	20.2	582	34.5	654	19.7	726	3.10	798	0.390
367	0.152	439	16.7	511	20.6	583	34.7	655	19.4	727	3.01	799	0.380
368	0.157	440	18.4	512	20.8	584	34.7	656	19.0	728	2.92	800	0.368
369	0.172	441	20.2	513	21.0	585	34.8	657	18.6	729	2.84	801	0.359
370	0.155	442	22.3	514	21.5	586	34.9	658	18.2	730	2.75	802	0.354
371	0.155	443	24.3	515	21.7	587	34.9	659	17.9	731	2.67	803	0.342
372	0.164	444	26.4	516	22.0	588	35.0	660	17.5	732	2.60	804	0.332
373	0.154	445	28.5	517	22.3	589	35.0	661	17.2	733	2.52	805	0.321
374	0.165	446	30.4	518	22.5	590	35.1	662	16.8	734	2.45	806	0.315
375	0.176	447	31.9	519	22.8	591	35.0	663	16.4	735	2.37	807	0.307
376	0.168	448	33.2	520	23.0	592	35.2	664	16.1	736	2.31	808	0.300
377	0.166	449	33.7	521	23.2	593	35.1	665	15.7	737	2.24	809	0.290
378	0.163	450	34.0	522	23.6	594	35.1	666	15.3	738	2.17	810	0.285
379	0.164	451	33.4	523	23.8	595	35.1	667	15.0	739	2.11	811	0.277
380	0.162	452	32.5	524	24.2	596	35.1	668	14.7	740	2.04	812	0.273
381	0.163	453	31.3	525	24.3	597	35.1	669	14.4	741	1.99	813	0.264
382	0.160	454	29.7	526	24.6	598	35.0	670	14.0	742	1.93	814	0.256
383	0.163	455	28.0	527	24.9	599	34.9	671	13.7	743	1.87	815	0.247
384	0.170	456	26.3	528	25.2	600	34.9	672	13.4	744	1.81	816	0.238
385	0.172	457	24.7	529	25.5	601	34.8	673	13.1	745	1.76	817	0.236
386	0.175	458	23.2	530	25.6	602	34.7	674	12.7	746	1.71	818	0.233
387	0.179	459	21.9	531	26.0	603	34.6	675	12.4	747	1.66	819	0.225
388	0.175	460	20.7	532	26.1	604	34.5	676	12.1	748	1.62	820	0.220
389	0.176	461	19.8	533	26.4	605	34.4	677	11.9	749	1.57	821	0.213
390	0.174	462	18.9	534	26.7	606	34.2	678	11.6	750	1.53	822	0.210
391	0.166	463	18.2	535	26.9	607	34.2	679	11.3	751	1.48	823	0.201
392	0.171	464	17.4	536	27.2	608	34.0	680	11.0	752	1.44	824	0.199
393	0.185	465	16.7	537	27.4	609	33.9	681	10.8	753	1.40	825	0.197
394	0.197	466	16.0	538	27.8	610	33.8	682	10.5	754	1.36	826	0.189
395	0.195	467	15.3	539	28.0	611	33.5	683	10.2	755	1.32	827	0.184
396	0.199	468	14.6	540	28.2	612	33.4	684	9.97	756	1.28	828	0.183
397	0.209	469	14.0	541	28.5	613	33.2	685	9.73	757	1.25	829	0.179
398	0.217	470	13.3	542	28.7	614	33.1	686	9.49	758	1.21	830	0.173
399	0.214	471	12.7	543	29.0	615	32.8	687	9.24	759	1.18	831	0.171
400	0.226	472	12.2	544	29.2	616	32.6	688	9.00	760	1.14	832	0.165
401	0.243	473	11.8	545	29.5	617	32.4	689	8.78	761	1.11	833	0.159
402	0.258	474	11.4	546	29.7	618	32.2	690	8.56	762	1.08	834	0.154
403	0.272	475	11.0	547	29.8	619	31.9	691	8.34	763	1.05	835	0.154
404	0.302	476	10.8	548	30.1	620	31.7	692	8.13	764	1.02	836	0.149
405	0.331	477	10.6	549	30.3	621	31.5	693	7.93	765	0.986	837	0.147
406	0.367	478	10.6	550	30.6	622	31.1	694	7.74	766	0.960	838	0.142
407	0.406	479	10.6	551	30.7	623	31.0	695	7.50	767	0.932	839	0.142
408	0.452	480	10.6	552	31.0	624	30.6	696	7.29	768	0.904	840	0.136
409	0.505	481	10.6	553	31.1	625	30.3	697	7.09	769	0.879	841	0.133
410	0.560	482	10.9	554	31.4	626	30.1	698	6.90	770	0.855	842	0.127
411	0.649	483	11.0	555	31.6	627	29.7	699	6.71	771	0.831	843	0.124
412	0.736	484	11.1	556	31.8	628	29.4	700	6.53	772	0.802	844	0.122
413	0.844	485	11.3	557	32.0	629	29.1	701	6.35	773	0.785	845	0.125
414	0.965	486	11.6	558	32.1	630	28.7	702	6.17	774	0.765	846	0.120
415	1.10	487	11.8	559	32.4	631	28.3	703	6.00	775	0.740	847	0.117
416	1.27	488	12.0	560	32.4	632	28.0	704	5.84	776	0.720	848	0.117
417	1.44	489	12.3	561	32.7	633	27.6	705	5.68	777	0.703	849	0.114
418	1.66	490	12.7	562	32.7	634	27.3	706	5.52	778	0.679	850	0.110
419	1.88	491	13.0	563	32.8	635	26.9	707	5.37	779	0.661		
420	2.16	492	13.3	564	33.0	636	26.5	708	5.21	780	0.643		
421	2.48	493	13.8	565	33.1	637	26.2	709	5.06	781	0.626		