



Les Industries Spectralux Inc. Spectralux Industries Inc.

2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca

ISO/IEC 17025
NVLAP
NVLAP LAB CODE: 200899-0

Sphere Test Report

Standard(s) CIE 84-1989, IESNA LM-16-93, IESNA LM-58-94, IES LM-79-08, ANSI C82.77-2002

Customer Lumenpulse, 1751 Richardson, suite 1505, Montréal, Québec, Canada, H3K 1G6

General Information		Lamp Details: CY2041	Driver Details: CY829	
Test Report	L1504214-C1	Description	CREE XPE2 LED's	Type Commercial
Test Date	21 April 2015	Manufacturer	Cree	Description 30W
Report Date	24 April 2015	Catalog No.	LOG-HO-120-24-40K- WWLF-SI-NO	Manufacturer MEAN WELL USA inc.
Sphere Temperature	25.3 °C	Serial No.	SRIS 1899	Catalog No. LPF-40-24
Humidity	26.0 %	Diameter	N/A mm	Voltage 120.00 V
Lamp Type	SSL	Color	White	Power Factor 0.9900

Stabilization Time: 60 minutes

Tested By: Jean-Paul Ojeil

Approved Signatory: Chrisnel Blot

Signature:

Notes

- 1) Field performance may differ from laboratory measurements. Results are valid for tested material only.
- 2) The original electronic file or paper report cannot be edited in whole or in part without written consent of Spectra Lux Industries Inc.
- 3) This test report describes the performance of a single product and does not necessarily represent the average performance of a group of the same SSL product.



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Realization of Sphere Test

A 4π sphere-spectroradiometer equipped with auxiliary lamp to correct self-absorption was used during the measurements of electrical, photometric and colorimetric properties of the sample under test. The size of the integrating sphere used is large enough to ensure that the measurement errors due to effects of baffle and self-absorption by the sample test are not significant.

During the test, a commercial driver was used and adjusted to nominal electrical characteristics specified by the driver manufacturer or the client. Good electrical contacts have been used to ensure the control of electrical parameters of the commercial driver and an adequate stabilization period prior to collecting data. The self-absorbance was measured and a geometrical correction factor was applied to the luminous flux value to take into account the sphere configuration.

Results of the measurements are traceable to reference standards developed and maintained by the National Institute of Standards and Technology (NIST) and National Research Council of Canada (NRC).





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Electrical Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Auxiliary Power Supply	American Reliance	SPS150-7	B10155	N.P.C.R.	N.P.C.R.
Test Power Supply	California Instruments	801RP	05816	N.P.C.R.	N.P.C.R.
Shunt Resistor	Fluke	Y5020	5675014	2014/08/06	2015/08/06
Current Multimeter	HP Agilent	HP34401A	US36121202	2014/08/06	2015/08/06
Voltage Multimeter	Fluke	Fluke8842A	5750288	2015/04/16	2016/04/16

Spectrometer Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Spectrometer	Ocean Optics	USB2000N	USB2E3864	2014/08/24	2015/08/24

Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	120504176	2014/04/16	2016/04/16



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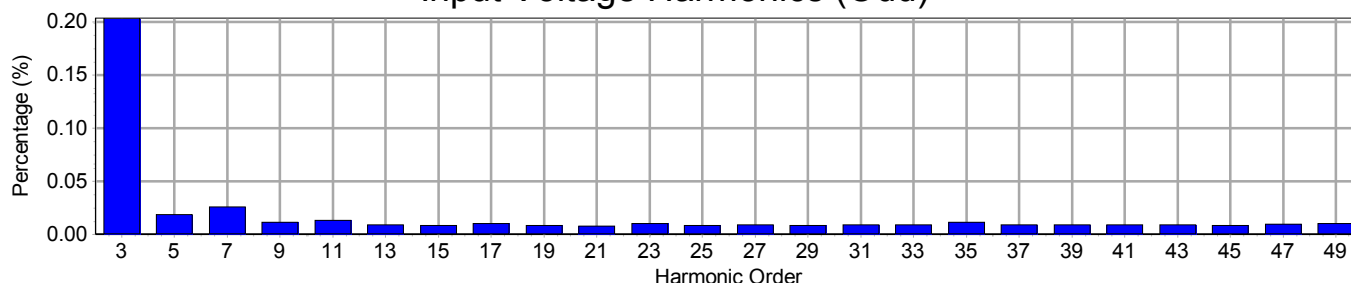
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Electrical Measurements

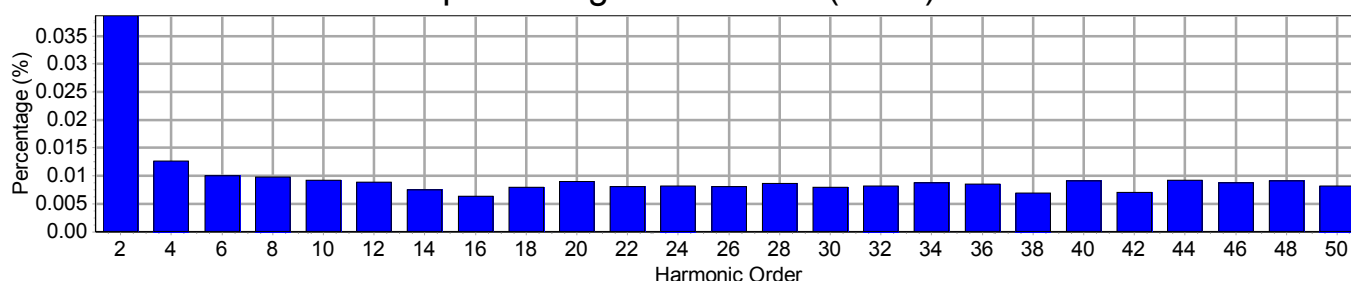
Input

Frequency	60 Hz	Active Power	30.93 W	THDV [ANSI]	0.22 %
Voltage	120.0 V(rms)	Apparent Power	31.24 VA	THDA [ANSI]	7.91 %
Current	0.2603 A(rms)	Power Factor	0.990	Max. Harmonic At	3rd order

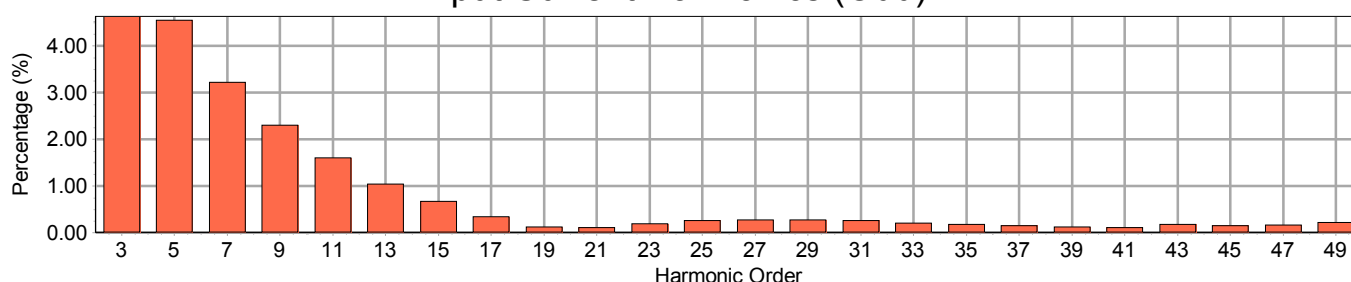
Input Voltage Harmonics (Odd)



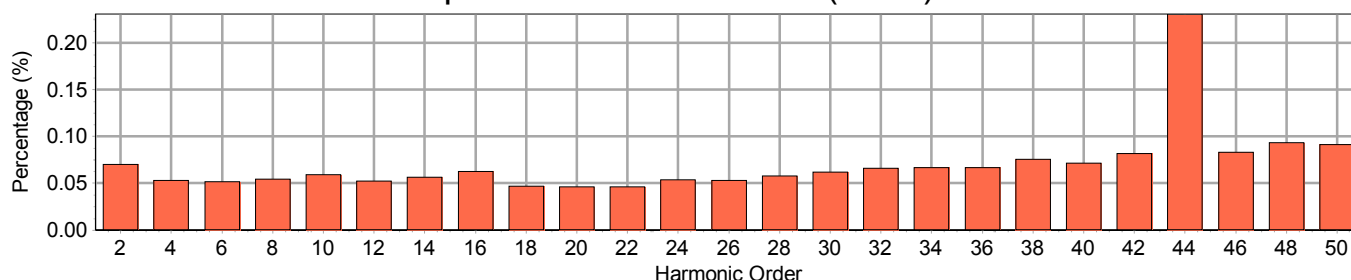
Input Voltage Harmonics (Even)



Input Current Harmonics (Odd)



Input Current Harmonics (Even)





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Harmonic Measurements

Odd Harmonics				Even Harmonics			
Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)	Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)
1	60	100.000	100.000	2	120	0.039	0.070
3	180	0.204	4.638	4	240	0.013	0.053
5	300	0.018	4.545	6	360	0.010	0.051
7	420	0.026	3.224	8	480	0.010	0.054
9	540	0.011	2.297	10	600	0.009	0.059
11	660	0.013	1.603	12	720	0.009	0.052
13	780	0.009	1.043	14	840	0.008	0.056
15	900	0.008	0.662	16	960	0.006	0.063
17	1020	0.010	0.330	18	1080	0.008	0.046
19	1140	0.008	0.118	20	1200	0.009	0.046
21	1260	0.008	0.103	22	1320	0.008	0.046
23	1380	0.010	0.191	24	1440	0.008	0.053
25	1500	0.008	0.254	26	1560	0.008	0.053
27	1620	0.009	0.265	28	1680	0.009	0.058
29	1740	0.008	0.263	30	1800	0.008	0.062
31	1860	0.009	0.247	32	1920	0.008	0.066
33	1980	0.009	0.194	34	2040	0.009	0.067
35	2100	0.011	0.172	36	2160	0.009	0.066
37	2220	0.009	0.150	38	2280	0.007	0.075
39	2340	0.009	0.117	40	2400	0.009	0.072
41	2460	0.009	0.105	42	2520	0.007	0.081
43	2580	0.009	0.170	44	2640	0.009	0.231
45	2700	0.008	0.150	46	2760	0.009	0.083
47	2820	0.009	0.157	48	2880	0.009	0.093
49	2940	0.010	0.210	50	3000	0.008	0.091



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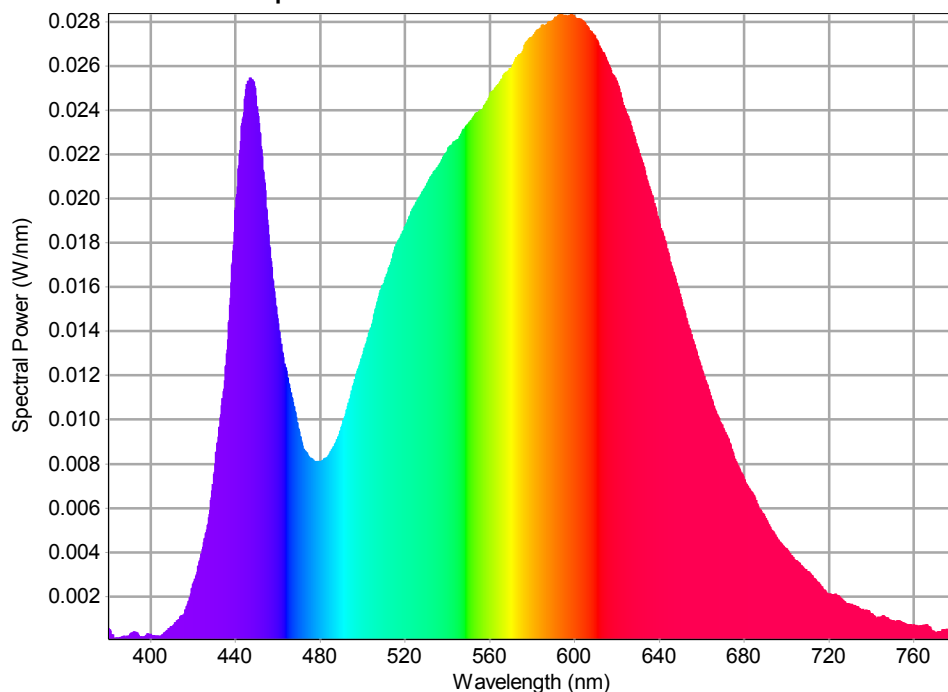
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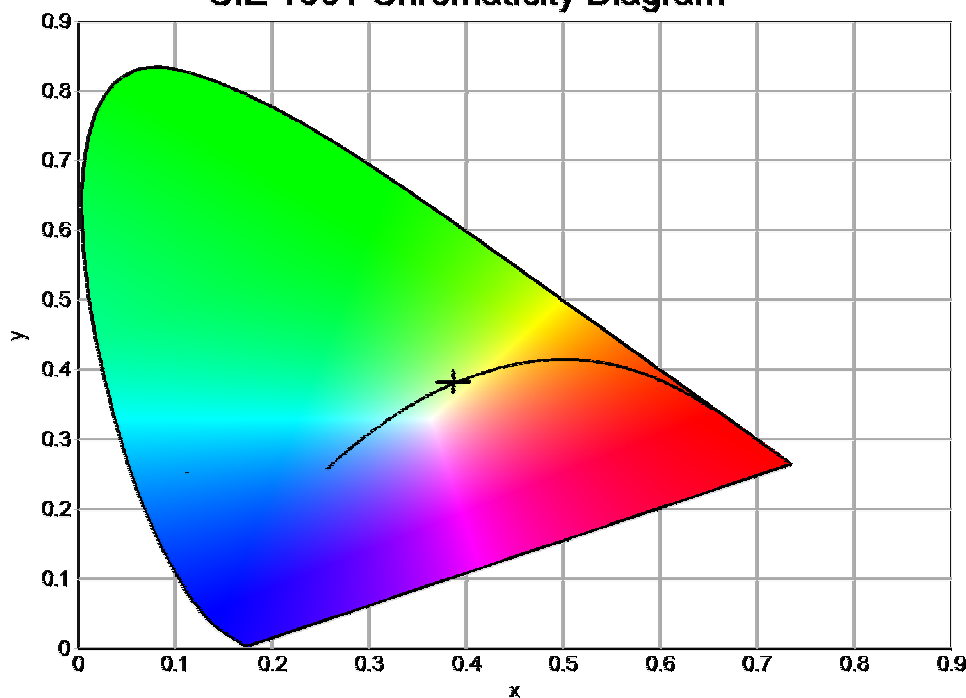
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Spectral Power Distribution



Peak Wavelength	599 nm
Luminous Flux	1651 lm
Input Power	30.93 W
Lumens/Watt	53.4
Full Width/Half Maximum	149.59
Center Wavelength	579 nm
Centroid Wavelength	371 nm
Dominant Wavelength	488 nm
Excitation Purity	0.1561
Colorimetric Purity	0.1029

CIE 1931 Chromaticity Diagram



x	0.3863	CCT	3894 K
y	0.3833	CRI	83
u	0.2263	L*	25.67
v	0.3369	a*	-5.08
u'	0.2263	b*	-13.72
v'	0.5053	Duv	0.0014
R1	80.8	R9	10.6
R2	87.5	R10	70.1
R3	92.8	R11	81.1
R4	82.6	R12	64.5
R5	80.9	R13	82.1
R6	83.0	R14	95.8
R7	86.8		
R8	66.0		



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Spectral Power Distribution Table (1/4)

Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)
380	0.00058	405	0.00024	430	0.00754	455	0.01904
381	0.00045	406	0.00032	431	0.00854	456	0.01789
382	0.00030	407	0.00040	432	0.00924	457	0.01691
383	0.00012	408	0.00048	433	0.01009	458	0.01596
384	0.00014	409	0.00056	434	0.01096	459	0.01516
385	0.00012	410	0.00066	435	0.01179	460	0.01436
386	0.00014	411	0.00072	436	0.01300	461	0.01368
387	0.00021	412	0.00085	437	0.01441	462	0.01308
388	0.00010	413	0.00096	438	0.01622	463	0.01254
389	0.00023	414	0.00110	439	0.01766	464	0.01220
390	0.00025	415	0.00116	440	0.01949	465	0.01166
391	0.00038	416	0.00125	441	0.02056	466	0.01123
392	0.00042	417	0.00156	442	0.02199	467	0.01081
393	0.00040	418	0.00181	443	0.02332	468	0.01040
394	0.00032	419	0.00215	444	0.02391	469	0.00990
395	0.00018	420	0.00258	445	0.02496	470	0.00945
396	0.00017	421	0.00279	446	0.02532	471	0.00906
397	0.00020	422	0.00311	447	0.02547	472	0.00870
398	0.00027	423	0.00358	448	0.02539	473	0.00856
399	0.00031	424	0.00393	449	0.02511	474	0.00841
400	0.00030	425	0.00446	450	0.02419	475	0.00828
401	0.00023	426	0.00485	451	0.02342	476	0.00824
402	0.00024	427	0.00525	452	0.02238	477	0.00813
403	0.00024	428	0.00594	453	0.02129	478	0.00812
404	0.00021	429	0.00679	454	0.02038	479	0.00813



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Spectral Power Distribution Table (2/4)

Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)
480	0.00813	505	0.01453	530	0.02057	555	0.02396
481	0.00815	506	0.01499	531	0.02078	556	0.02400
482	0.00825	507	0.01532	532	0.02100	557	0.02411
483	0.00829	508	0.01573	533	0.02109	558	0.02430
484	0.00839	509	0.01596	534	0.02127	559	0.02443
485	0.00857	510	0.01616	535	0.02140	560	0.02466
486	0.00873	511	0.01645	536	0.02151	561	0.02486
487	0.00891	512	0.01670	537	0.02168	562	0.02492
488	0.00911	513	0.01700	538	0.02189	563	0.02507
489	0.00934	514	0.01729	539	0.02204	564	0.02517
490	0.00966	515	0.01770	540	0.02219	565	0.02530
491	0.00997	516	0.01794	541	0.02237	566	0.02545
492	0.01028	517	0.01813	542	0.02243	567	0.02566
493	0.01061	518	0.01832	543	0.02257	568	0.02573
494	0.01094	519	0.01854	544	0.02265	569	0.02582
495	0.01132	520	0.01873	545	0.02269	570	0.02588
496	0.01167	521	0.01892	546	0.02283	571	0.02607
497	0.01205	522	0.01919	547	0.02304	572	0.02631
498	0.01231	523	0.01941	548	0.02315	573	0.02637
499	0.01262	524	0.01961	549	0.02330	574	0.02653
500	0.01291	525	0.01976	550	0.02343	575	0.02658
501	0.01325	526	0.01996	551	0.02354	576	0.02679
502	0.01355	527	0.02010	552	0.02366	577	0.02708
503	0.01392	528	0.02028	553	0.02382	578	0.02716
504	0.01415	529	0.02044	554	0.02391	579	0.02731



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Spectral Power Distribution Table (3/4)

Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)
580	0.02732	605	0.02793	630	0.02223	655	0.01387
581	0.02743	606	0.02780	631	0.02192	656	0.01356
582	0.02760	607	0.02762	632	0.02165	657	0.01323
583	0.02767	608	0.02755	633	0.02127	658	0.01290
584	0.02773	609	0.02742	634	0.02088	659	0.01258
585	0.02787	610	0.02724	635	0.02057	660	0.01228
586	0.02785	611	0.02705	636	0.02023	661	0.01199
587	0.02790	612	0.02683	637	0.01999	662	0.01171
588	0.02803	613	0.02665	638	0.01964	663	0.01142
589	0.02803	614	0.02652	639	0.01923	664	0.01111
590	0.02809	615	0.02628	640	0.01887	665	0.01083
591	0.02822	616	0.02608	641	0.01857	666	0.01051
592	0.02825	617	0.02583	642	0.01832	667	0.01027
593	0.02836	618	0.02561	643	0.01798	668	0.01008
594	0.02835	619	0.02548	644	0.01760	669	0.00983
595	0.02828	620	0.02523	645	0.01715	670	0.00964
596	0.02828	621	0.02499	646	0.01684	671	0.00943
597	0.02826	622	0.02461	647	0.01656	672	0.00924
598	0.02831	623	0.02424	648	0.01620	673	0.00898
599	0.02830	624	0.02396	649	0.01590	674	0.00869
600	0.02823	625	0.02378	650	0.01554	675	0.00837
601	0.02815	626	0.02352	651	0.01515	676	0.00814
602	0.02815	627	0.02314	652	0.01483	677	0.00793
603	0.02813	628	0.02288	653	0.01448	678	0.00770
604	0.02805	629	0.02251	654	0.01416	679	0.00755



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Spectral Power Distribution Table (4/4)

Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)	Wavelength (nm)	Spectral Power (W/nm)
680	0.00731	706	0.00354	732	0.00162	758	0.00074
681	0.00709	707	0.00340	733	0.00156	759	0.00069
682	0.00693	708	0.00330	734	0.00149	760	0.00074
683	0.00679	709	0.00325	735	0.00143	761	0.00072
684	0.00666	710	0.00314	736	0.00144	762	0.00067
685	0.00649	711	0.00306	737	0.00136	763	0.00069
686	0.00623	712	0.00297	738	0.00138	764	0.00069
687	0.00600	713	0.00282	739	0.00134	765	0.00073
688	0.00587	714	0.00272	740	0.00125	766	0.00074
689	0.00574	715	0.00265	741	0.00115	767	0.00066
690	0.00556	716	0.00249	742	0.00103	768	0.00055
691	0.00536	717	0.00236	743	0.00108	769	0.00046
692	0.00518	718	0.00230	744	0.00106	770	0.00039
693	0.00502	719	0.00217	745	0.00110	771	0.00038
694	0.00490	720	0.00211	746	0.00112	772	0.00044
695	0.00472	721	0.00211	747	0.00103	773	0.00043
696	0.00457	722	0.00209	748	0.00098	774	0.00051
697	0.00446	723	0.00213	749	0.00096	775	0.00049
698	0.00434	724	0.00205	750	0.00093	776	0.00053
699	0.00423	725	0.00200	751	0.00089	777	0.00043
700	0.00417	726	0.00190	752	0.00092	778	0.00040
701	0.00401	727	0.00180	753	0.00093	779	0.00027
702	0.00388	728	0.00170	754	0.00088	780	0.00028
703	0.00378	729	0.00170	755	0.00085		
704	0.00364	730	0.00165	756	0.00079		
705	0.00361	731	0.00164	757	0.00076		



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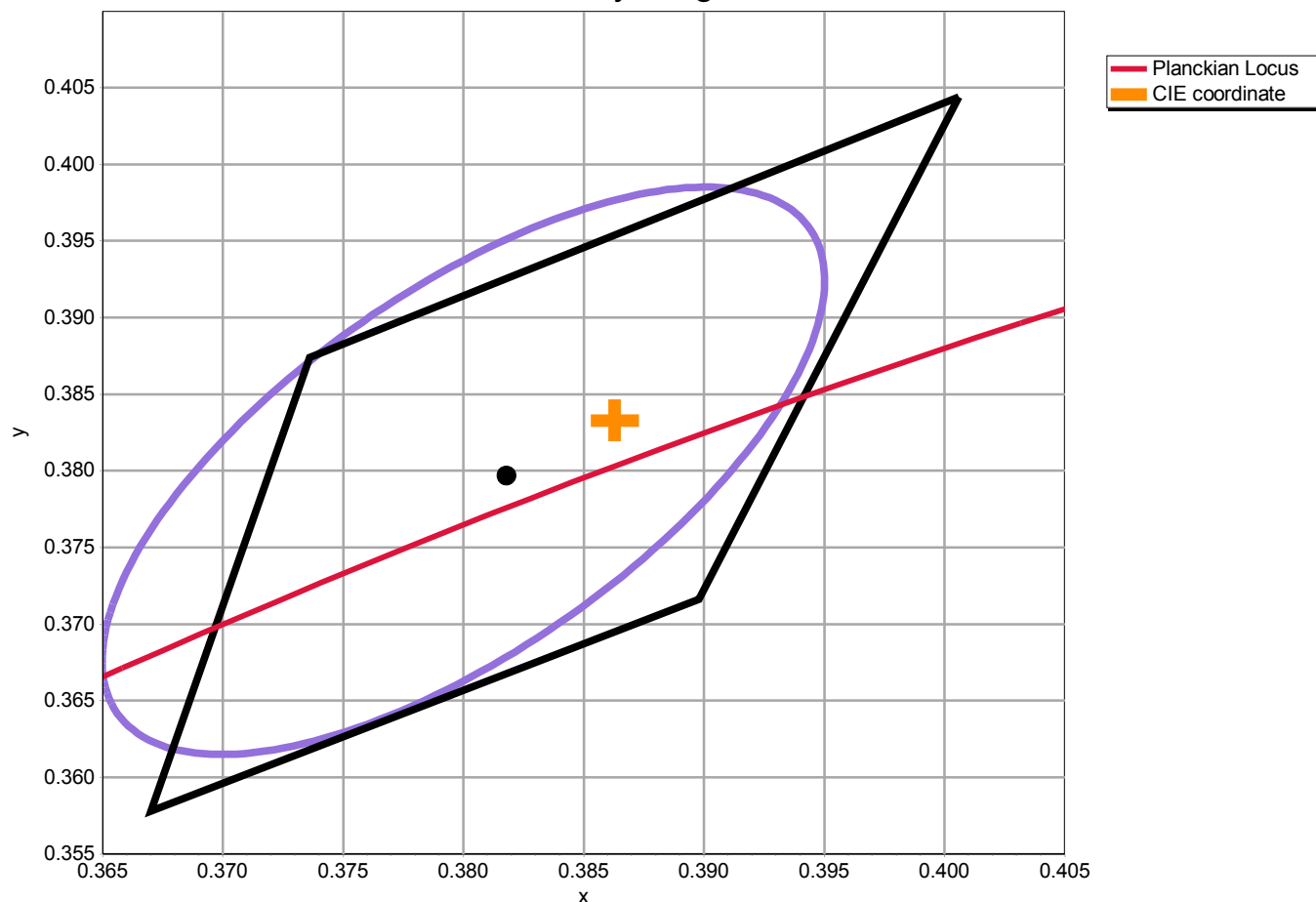
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CIE Chromaticity Diagram for Indoor SSL products

CIE 1931 Chromaticity Diagram



Chromaticity tolerance for 4000K nominal CCT

Min CCT	3710
Max CCT	4260
Delta T	275
Center Duv	0.0010