



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: CY2037	Driver Details: CY825	
Test Report	L1504213-C1	Description	CREE XPE2 LED's	Type Commercial
Test Date	21 April 2015	Manufacturer	Cree	Description 34W
Report Date	24 April 2015	Catalog No.	LOG-RO-120-48-40K- WWLF-SI-NO	Manufacturer MEAN WELL USA inc.
Sphere Temperature	26.0 °C	Serial No.	SRIS 1901	Catalog No. LPF-40-24
Humidity	26.4 %	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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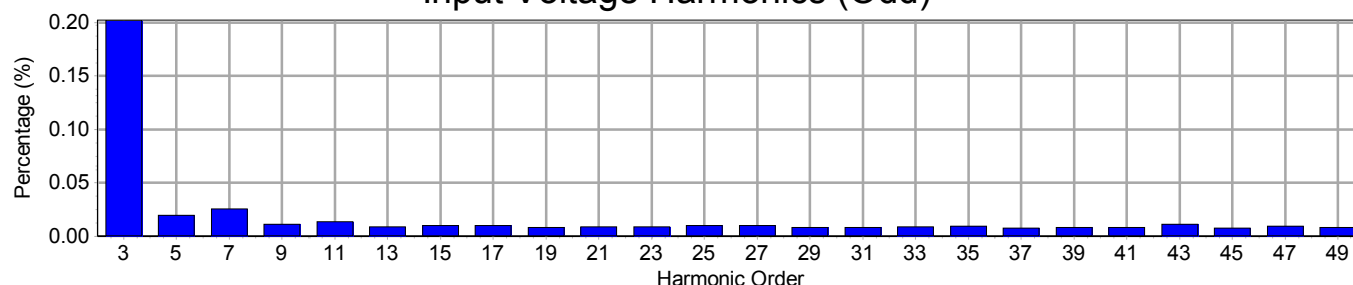
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Electrical Measurements

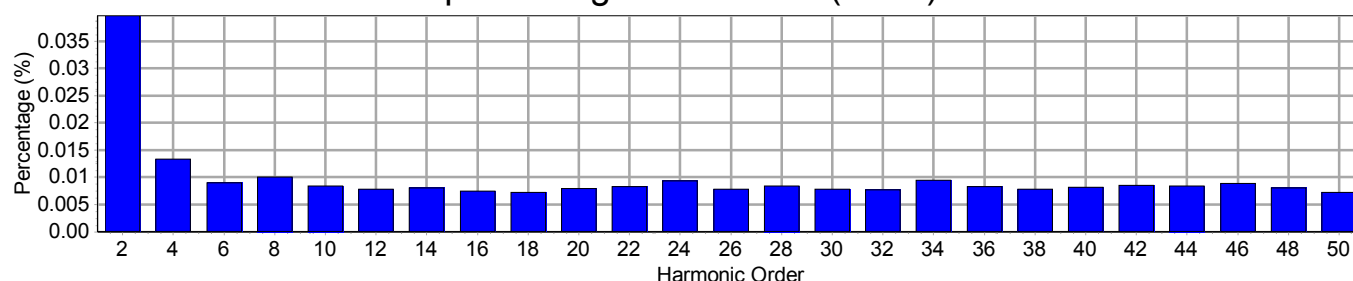
Input

Frequency	60 Hz	Active Power	30.94 W	THDV [ANSI]	0.22 %
Voltage	120.0 V(rms)	Apparent Power	31.24 VA	THDA [ANSI]	7.78 %
Current	0.2604 A(rms)	Power Factor	0.990	Max. Harmonic At	5th order

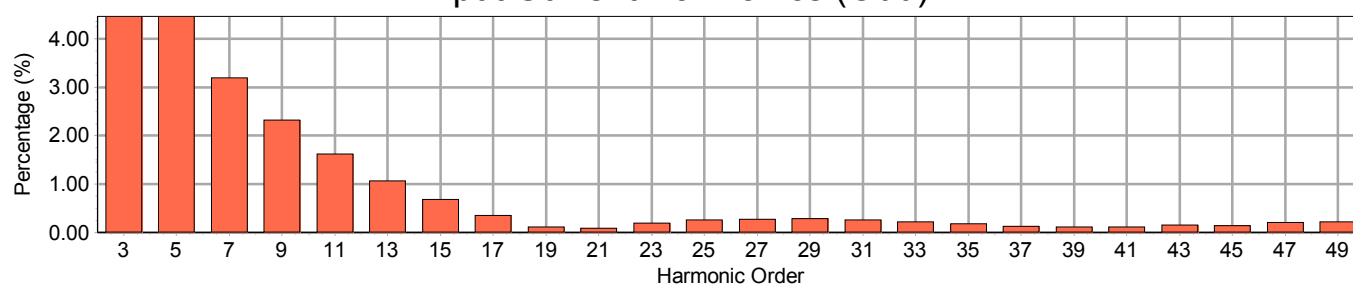
Input Voltage Harmonics (Odd)



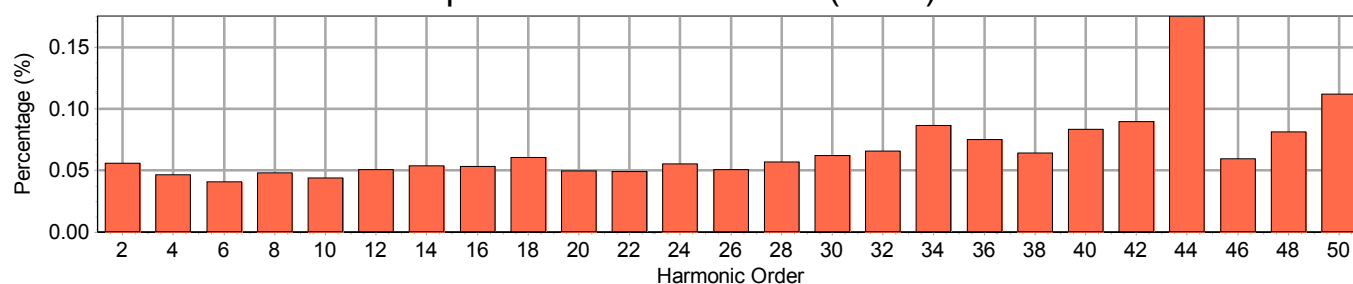
Input Voltage Harmonics (Even)



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	0.040	0.056
3	180	0.203	4.467	4	240	0.013	0.047
5	300	0.020	4.473	6	360	0.009	0.041
7	420	0.025	3.199	8	480	0.010	0.048
9	540	0.011	2.318	10	600	0.008	0.044
11	660	0.014	1.627	12	720	0.008	0.051
13	780	0.009	1.068	14	840	0.008	0.054
15	900	0.010	0.678	16	960	0.008	0.053
17	1020	0.010	0.348	18	1080	0.007	0.061
19	1140	0.008	0.107	20	1200	0.008	0.050
21	1260	0.009	0.087	22	1320	0.008	0.049
23	1380	0.009	0.196	24	1440	0.009	0.056
25	1500	0.010	0.262	26	1560	0.008	0.051
27	1620	0.010	0.270	28	1680	0.008	0.057
29	1740	0.008	0.279	30	1800	0.008	0.062
31	1860	0.008	0.257	32	1920	0.008	0.066
33	1980	0.009	0.223	34	2040	0.010	0.086
35	2100	0.009	0.184	36	2160	0.008	0.075
37	2220	0.008	0.125	38	2280	0.008	0.064
39	2340	0.008	0.113	40	2400	0.008	0.083
41	2460	0.008	0.110	42	2520	0.009	0.089
43	2580	0.011	0.157	44	2640	0.008	0.176
45	2700	0.007	0.137	46	2760	0.009	0.059
47	2820	0.009	0.204	48	2880	0.008	0.081
49	2940	0.008	0.214	50	3000	0.007	0.112



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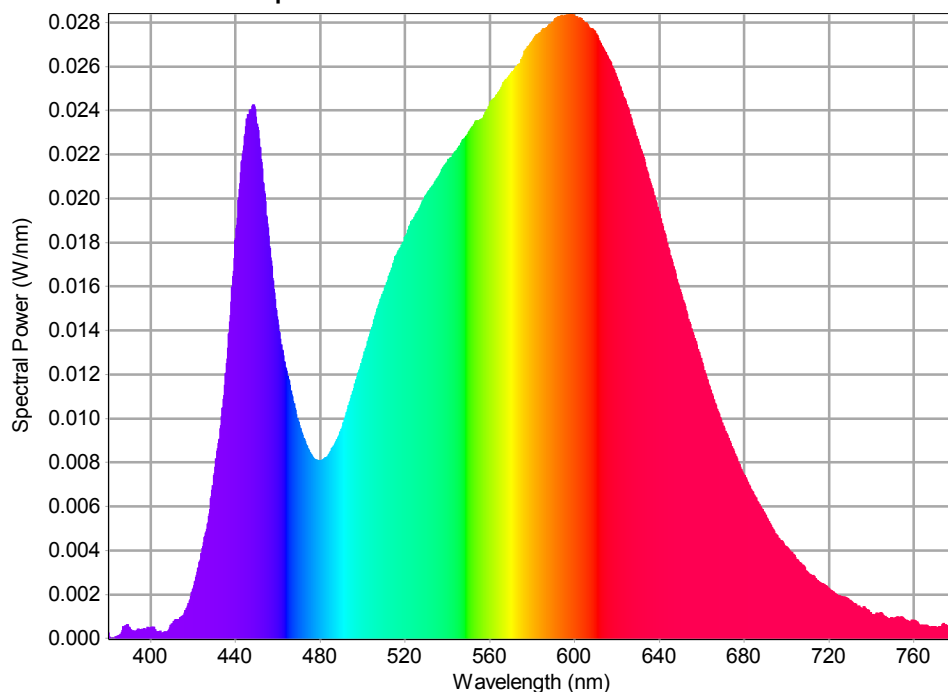
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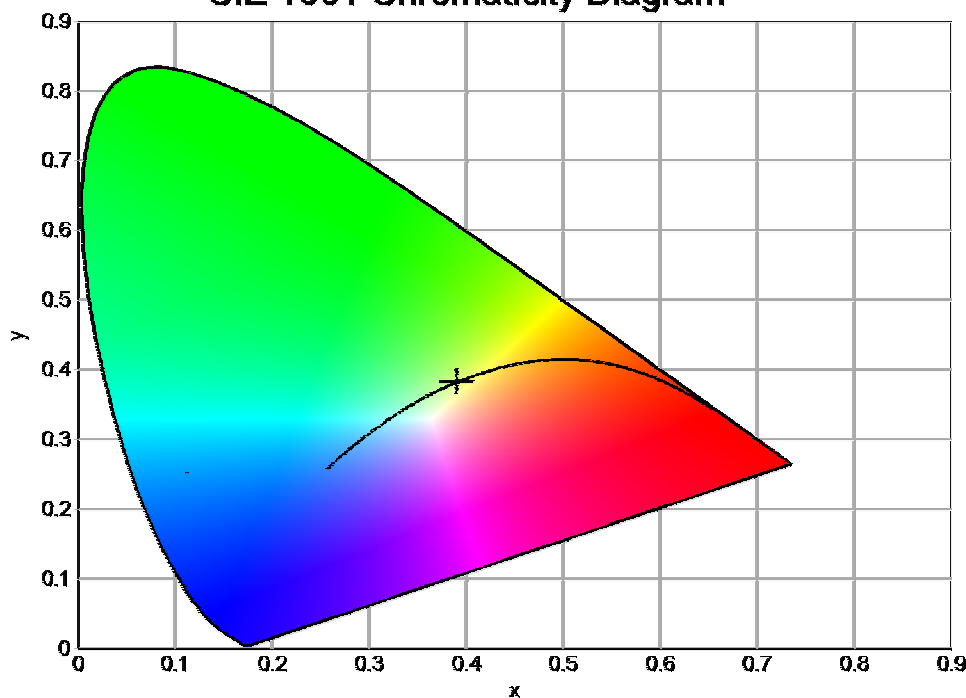
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Spectral Power Distribution



Peak Wavelength	599 nm
Luminous Flux	1635 lm
Input Power	30.94 W
Lumens/Watt	52.8
Full Width/Half Maximum	149.98
Center Wavelength	580 nm
Centroid Wavelength	373 nm
Dominant Wavelength	488 nm
Excitation Purity	0.1483
Colorimetric Purity	0.0963

CIE 1931 Chromaticity Diagram



x	0.3895	CCT	3818 K
y	0.3840	CRI	83
u	0.2281	L*	25.67
v	0.3374	a*	-4.71
u'	0.2281	b*	-13.19
v'	0.5061	Duv	0.0008
R1	81.5	R9	12.6
R2	88.2	R10	71.7
R3	93.4	R11	81.5
R4	82.9	R12	65.9
R5	81.5	R13	82.8
R6	84.0	R14	96.1
R7	86.8		
R8	66.3		



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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	0.00026	405	0.00024	430	0.00742	455	0.01886
381	0.00001	406	0.00028	431	0.00818	456	0.01784
382	0.00005	407	0.00031	432	0.00889	457	0.01696
383	0.00000	408	0.00033	433	0.00955	458	0.01590
384	0.00005	409	0.00051	434	0.01047	459	0.01501
385	0.00014	410	0.00067	435	0.01152	460	0.01427
386	0.00020	411	0.00079	436	0.01253	461	0.01363
387	0.00055	412	0.00089	437	0.01385	462	0.01314
388	0.00059	413	0.00087	438	0.01530	463	0.01260
389	0.00065	414	0.00097	439	0.01647	464	0.01218
390	0.00052	415	0.00103	440	0.01810	465	0.01178
391	0.00037	416	0.00117	441	0.01912	466	0.01127
392	0.00035	417	0.00138	442	0.02044	467	0.01082
393	0.00030	418	0.00160	443	0.02167	468	0.01049
394	0.00045	419	0.00193	444	0.02241	469	0.01003
395	0.00042	420	0.00225	445	0.02329	470	0.00970
396	0.00043	421	0.00260	446	0.02383	471	0.00940
397	0.00047	422	0.00303	447	0.02405	472	0.00912
398	0.00041	423	0.00347	448	0.02422	473	0.00886
399	0.00050	424	0.00387	449	0.02417	474	0.00865
400	0.00050	425	0.00436	450	0.02341	475	0.00846
401	0.00051	426	0.00480	451	0.02274	476	0.00831
402	0.00041	427	0.00521	452	0.02180	477	0.00819
403	0.00029	428	0.00587	453	0.02074	478	0.00813
404	0.00029	429	0.00676	454	0.01988	479	0.00809



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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	0.00810	505	0.01429	530	0.02018	555	0.02355
481	0.00811	506	0.01468	531	0.02035	556	0.02364
482	0.00819	507	0.01499	532	0.02047	557	0.02370
483	0.00825	508	0.01529	533	0.02059	558	0.02392
484	0.00835	509	0.01554	534	0.02076	559	0.02407
485	0.00852	510	0.01577	535	0.02091	560	0.02428
486	0.00872	511	0.01605	536	0.02103	561	0.02449
487	0.00887	512	0.01629	537	0.02123	562	0.02456
488	0.00904	513	0.01662	538	0.02142	563	0.02470
489	0.00926	514	0.01685	539	0.02155	564	0.02484
490	0.00952	515	0.01721	540	0.02168	565	0.02496
491	0.00981	516	0.01745	541	0.02180	566	0.02517
492	0.01013	517	0.01763	542	0.02188	567	0.02535
493	0.01043	518	0.01780	543	0.02204	568	0.02542
494	0.01075	519	0.01802	544	0.02214	569	0.02558
495	0.01108	520	0.01825	545	0.02230	570	0.02571
496	0.01140	521	0.01843	546	0.02242	571	0.02577
497	0.01176	522	0.01874	547	0.02264	572	0.02598
498	0.01208	523	0.01897	548	0.02272	573	0.02603
499	0.01238	524	0.01908	549	0.02285	574	0.02615
500	0.01269	525	0.01927	550	0.02302	575	0.02633
501	0.01304	526	0.01940	551	0.02318	576	0.02654
502	0.01330	527	0.01957	552	0.02329	577	0.02678
503	0.01368	528	0.01982	553	0.02349	578	0.02691
504	0.01399	529	0.01998	554	0.02354	579	0.02704



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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	0.02715	605	0.02801	630	0.02258	655	0.01410
581	0.02732	606	0.02794	631	0.02228	656	0.01379
582	0.02746	607	0.02777	632	0.02203	657	0.01354
583	0.02751	608	0.02774	633	0.02164	658	0.01316
584	0.02757	609	0.02765	634	0.02128	659	0.01287
585	0.02772	610	0.02750	635	0.02092	660	0.01257
586	0.02772	611	0.02731	636	0.02060	661	0.01221
587	0.02780	612	0.02709	637	0.02032	662	0.01192
588	0.02793	613	0.02691	638	0.01994	663	0.01159
589	0.02795	614	0.02672	639	0.01961	664	0.01132
590	0.02803	615	0.02655	640	0.01929	665	0.01103
591	0.02821	616	0.02637	641	0.01890	666	0.01073
592	0.02825	617	0.02619	642	0.01855	667	0.01045
593	0.02830	618	0.02593	643	0.01819	668	0.01022
594	0.02834	619	0.02572	644	0.01779	669	0.00997
595	0.02830	620	0.02543	645	0.01744	670	0.00968
596	0.02834	621	0.02519	646	0.01711	671	0.00943
597	0.02835	622	0.02491	647	0.01680	672	0.00926
598	0.02840	623	0.02462	648	0.01637	673	0.00899
599	0.02834	624	0.02444	649	0.01605	674	0.00874
600	0.02830	625	0.02417	650	0.01574	675	0.00853
601	0.02828	626	0.02383	651	0.01541	676	0.00829
602	0.02821	627	0.02347	652	0.01512	677	0.00805
603	0.02821	628	0.02320	653	0.01476	678	0.00781
604	0.02809	629	0.02285	654	0.01441	679	0.00760



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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	0.00743	706	0.00348	732	0.00160	758	0.00076
681	0.00722	707	0.00336	733	0.00150	759	0.00085
682	0.00701	708	0.00332	734	0.00149	760	0.00083
683	0.00682	709	0.00311	735	0.00141	761	0.00080
684	0.00666	710	0.00300	736	0.00137	762	0.00069
685	0.00646	711	0.00293	737	0.00141	763	0.00063
686	0.00627	712	0.00285	738	0.00132	764	0.00063
687	0.00613	713	0.00282	739	0.00120	765	0.00058
688	0.00594	714	0.00268	740	0.00110	766	0.00063
689	0.00578	715	0.00261	741	0.00110	767	0.00057
690	0.00562	716	0.00255	742	0.00110	768	0.00054
691	0.00543	717	0.00251	743	0.00114	769	0.00057
692	0.00523	718	0.00244	744	0.00116	770	0.00057
693	0.00506	719	0.00238	745	0.00114	771	0.00052
694	0.00490	720	0.00229	746	0.00101	772	0.00056
695	0.00473	721	0.00220	747	0.00097	773	0.00057
696	0.00458	722	0.00212	748	0.00091	774	0.00071
697	0.00445	723	0.00205	749	0.00092	775	0.00064
698	0.00442	724	0.00197	750	0.00093	776	0.00060
699	0.00424	725	0.00195	751	0.00093	777	0.00052
700	0.00416	726	0.00192	752	0.00099	778	0.00049
701	0.00405	727	0.00191	753	0.00097	779	0.00040
702	0.00395	728	0.00188	754	0.00098	780	0.00039
703	0.00386	729	0.00182	755	0.00095		
704	0.00370	730	0.00174	756	0.00084		
705	0.00360	731	0.00166	757	0.00082		



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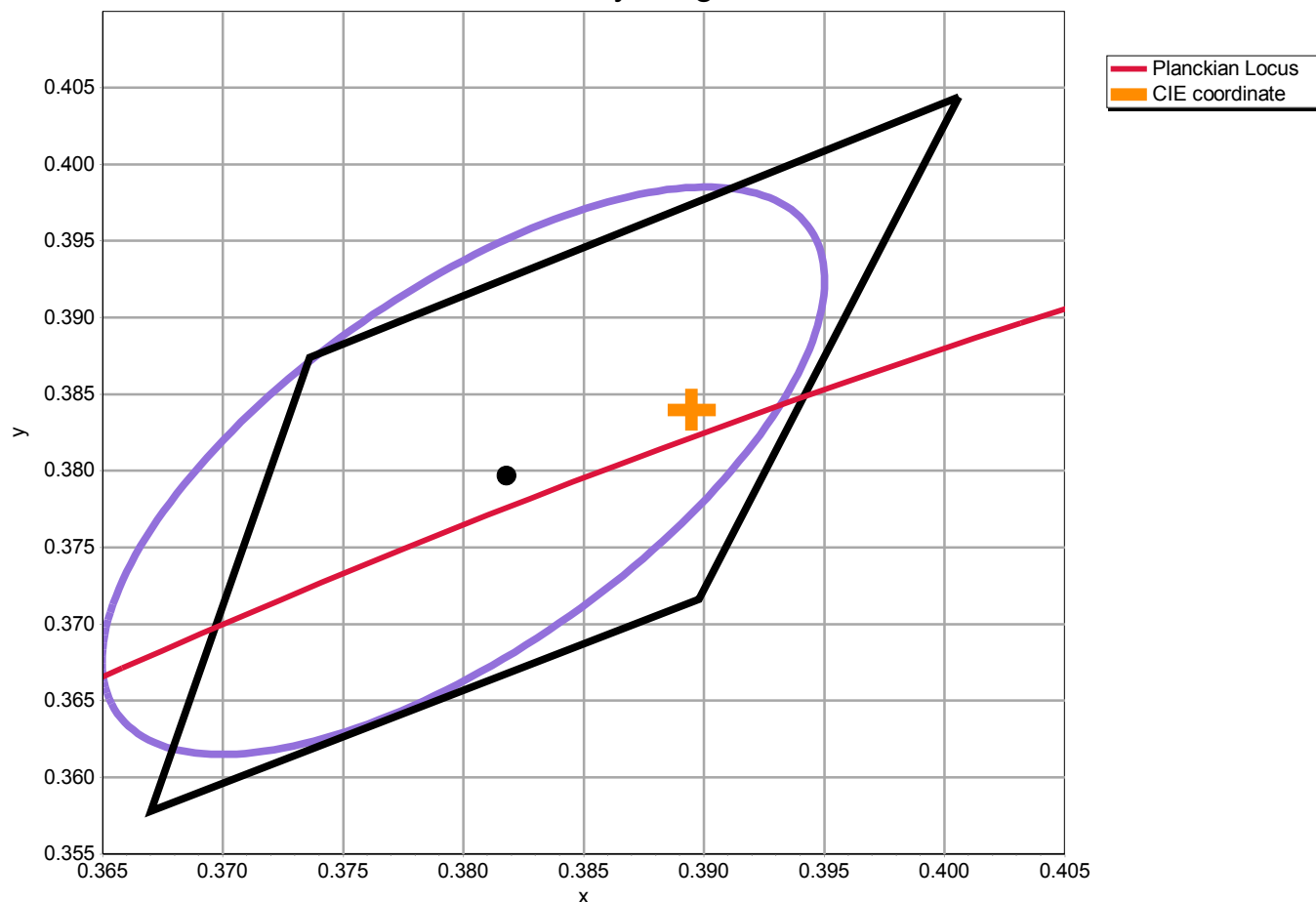
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CIE Chromaticity Diagram for Indoor SSL products

CIE 1931 Chromaticity Diagram



Chromaticity tolerance for 4000K nominal CCT

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