



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: CY2402	Driver Details: CY963	
Test Report	L1512074-C1	Description	Clusters of 48 Cree XPE2 LED's	Type Commercial
Test Date	7 December 2015	Manufacturer	Cree	Description 61W
Report Date	8 December 2015	Catalog No.	LOGI-HO-120/277-48-27K-10x60-SI-NO	Manufacturer Mean Well
Sphere Temperature	23.0 °C	Serial No.	SRIS 2227	Catalog No. LPF-60-24
Humidity	22.8 %	Diameter	N/A mm	Voltage 120.00 V
Lamp Type	SSL	Color	White	Power Factor 0.9900

Stabilization Time: 10 min

Tested By: AFWJk cbc i GYbU

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.



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).





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

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	iRDC	CIF-3000A	974997	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	91L236540	2015/10/22	2016/10/22
Output Power Meter	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.
Shunt Resistor	Fluke	Y5020	5675014	2015/08/06	2016/08/06
Current Multimeter	HP Agilent	HP34401A	US36121202	2015/08/06	2016/08/06
Voltage Multimeter	Fluke	Fluke8842A	4282317	2014/10/31	2016/10/31

Spectrometer Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Spectrometer	Ocean Optics	USB2000N	USB2E3864	2015/08/24	2016/08/24

Environment Equipment

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



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



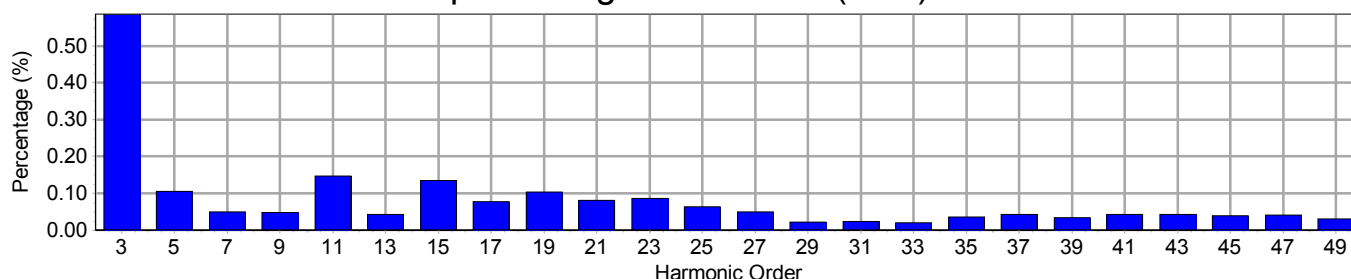
NVLAP LAB CODE: 200899-0

Electrical Measurements

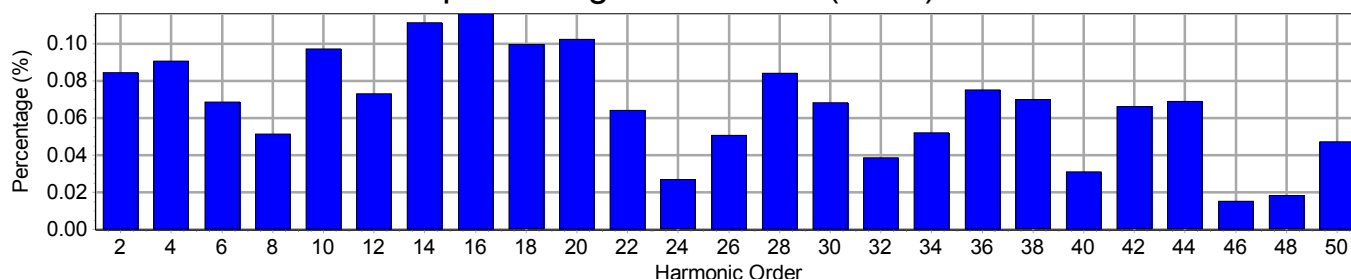
Input

Frequency	60 Hz	Active Power	60.93 W	THDV [ANSI]	0.75 %
Voltage	120.1 V(rms)	Apparent Power	61.45 VA	THDA [ANSI]	5.14 %
Current	0.5118 A(rms)	Power Factor	0.992	Max. Harmonic At	5th order

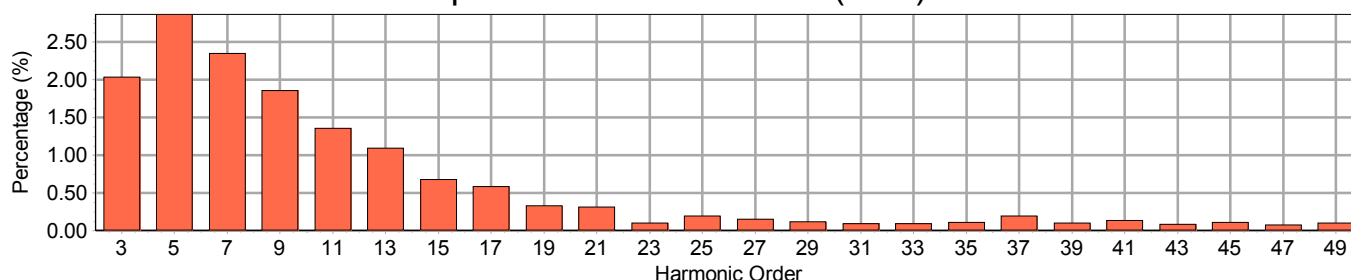
Input Voltage Harmonics (Odd)



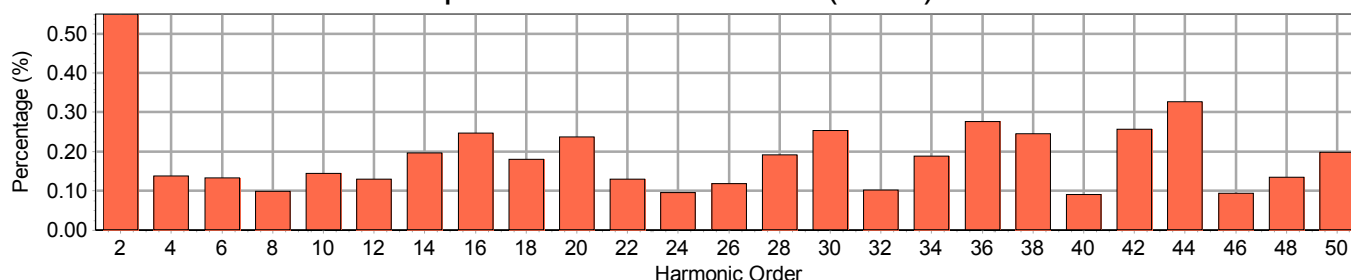
Input Voltage Harmonics (Even)



Input Current Harmonics (Odd)



Input Current Harmonics (Even)





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 LAB CODE: 200899-0

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	0.084	0.551
3	180	0.587	2.036	4	240	0.091	0.138
5	300	0.105	2.871	6	360	0.069	0.133
7	420	0.050	2.348	8	480	0.051	0.098
9	540	0.047	1.853	10	600	0.097	0.144
11	660	0.147	1.357	12	720	0.073	0.129
13	780	0.042	1.091	14	840	0.111	0.196
15	900	0.134	0.674	16	960	0.116	0.247
17	1020	0.078	0.584	18	1080	0.099	0.181
19	1140	0.104	0.329	20	1200	0.102	0.238
21	1260	0.082	0.307	22	1320	0.064	0.130
23	1380	0.087	0.101	24	1440	0.027	0.095
25	1500	0.064	0.194	26	1560	0.051	0.119
27	1620	0.049	0.148	28	1680	0.084	0.192
29	1740	0.022	0.114	30	1800	0.068	0.253
31	1860	0.024	0.093	32	1920	0.039	0.101
33	1980	0.020	0.089	34	2040	0.052	0.188
35	2100	0.036	0.110	36	2160	0.075	0.276
37	2220	0.042	0.190	38	2280	0.070	0.246
39	2340	0.034	0.100	40	2400	0.031	0.090
41	2460	0.043	0.132	42	2520	0.066	0.256
43	2580	0.043	0.079	44	2640	0.069	0.327
45	2700	0.039	0.103	46	2760	0.015	0.093
47	2820	0.040	0.076	48	2880	0.019	0.134
49	2940	0.030	0.100	50	3000	0.047	0.199



Les Industries Spectralux Inc. Spectralux Industries Inc.

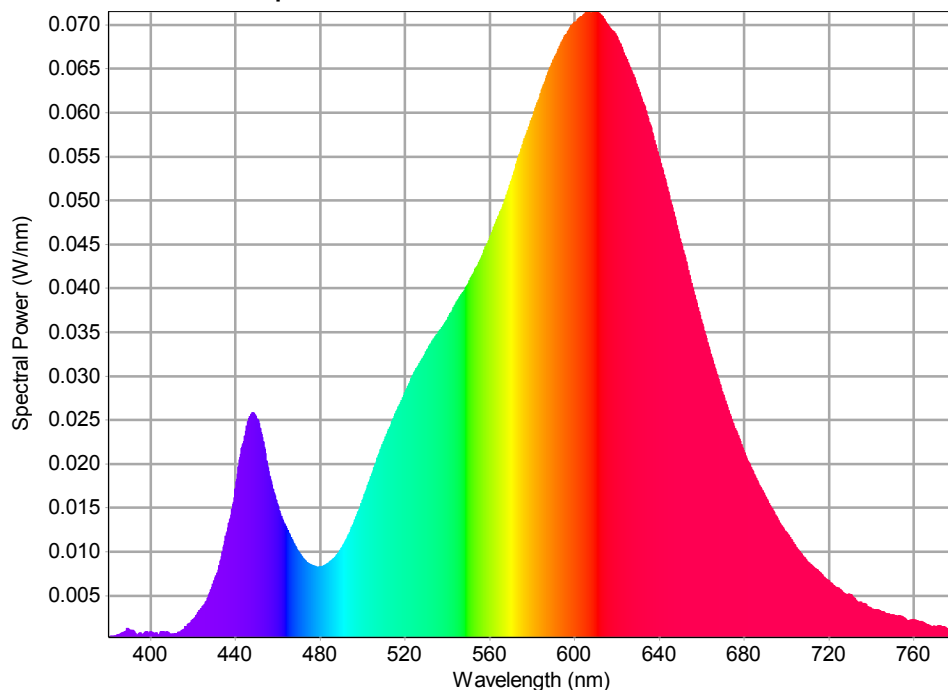
2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca

ISO/IEC 17025



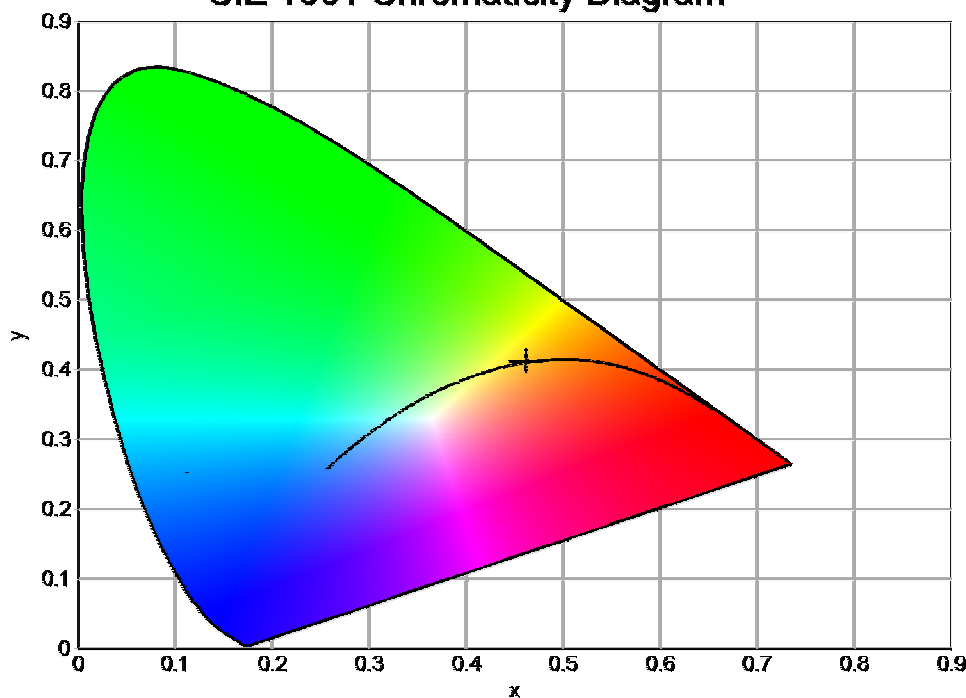
NVLAP LAB CODE: 200899-0

Spectral Power Distribution



Peak Wavelength	606 nm
Luminous Flux	3311 lm
Input Power	60.93 W
Lumens/Watt	54.3
Full Width/Half Maximum	122.45
Center Wavelength	599 nm
Centroid Wavelength	419 nm
Dominant Wavelength	586 nm
Excitation Purity	0.1281
Colorimetric Purity	0.1388

CIE 1931 Chromaticity Diagram



x	0.4610	CCT	2699 K
y	0.4125	CRI	81
u	0.2624	L*	25.67
v	0.3522	a*	1.03
u'	0.2624	b*	3.47
v'	0.5282	Duv	0.0006
R1	79.1	R9	5.8
R2	88.5	R10	73.2
R3	96.5	R11	77.5
R4	79.2	R12	67.3
R5	78.3	R13	80.9
R6	85.5	R14	97.8
R7	82.9		
R8	57.8		



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 LAB CODE: 200899-0

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	0.00035	405	0.00097	430	0.00672	455	0.01986
381	0.00035	406	0.00096	431	0.00727	456	0.01870
382	0.00041	407	0.00087	432	0.00797	457	0.01767
383	0.00044	408	0.00092	433	0.00900	458	0.01678
384	0.00057	409	0.00056	434	0.01001	459	0.01600
385	0.00057	410	0.00066	435	0.01125	460	0.01517
386	0.00071	411	0.00071	436	0.01221	461	0.01437
387	0.00082	412	0.00078	437	0.01328	462	0.01376
388	0.00099	413	0.00091	438	0.01425	463	0.01320
389	0.00133	414	0.00089	439	0.01544	464	0.01272
390	0.00108	415	0.00113	440	0.01718	465	0.01220
391	0.00107	416	0.00130	441	0.01892	466	0.01168
392	0.00104	417	0.00151	442	0.02049	467	0.01119
393	0.00063	418	0.00183	443	0.02183	468	0.01072
394	0.00061	419	0.00201	444	0.02262	469	0.01027
395	0.00081	420	0.00233	445	0.02378	470	0.00992
396	0.00057	421	0.00253	446	0.02489	471	0.00959
397	0.00075	422	0.00292	447	0.02547	472	0.00926
398	0.00099	423	0.00336	448	0.02591	473	0.00898
399	0.00078	424	0.00356	449	0.02569	474	0.00875
400	0.00097	425	0.00389	450	0.02519	475	0.00860
401	0.00081	426	0.00429	451	0.02464	476	0.00849
402	0.00073	427	0.00476	452	0.02362	477	0.00842
403	0.00068	428	0.00543	453	0.02259	478	0.00835
404	0.00054	429	0.00601	454	0.02124	479	0.00828



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 LAB CODE: 200899-0

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	0.00831	505	0.01928	530	0.03283	555	0.04298
481	0.00835	506	0.01996	531	0.03321	556	0.04352
482	0.00851	507	0.02069	532	0.03366	557	0.04405
483	0.00862	508	0.02131	533	0.03406	558	0.04475
484	0.00876	509	0.02198	534	0.03441	559	0.04515
485	0.00898	510	0.02252	535	0.03475	560	0.04574
486	0.00919	511	0.02313	536	0.03510	561	0.04637
487	0.00941	512	0.02375	537	0.03540	562	0.04700
488	0.00969	513	0.02420	538	0.03573	563	0.04764
489	0.01003	514	0.02489	539	0.03612	564	0.04818
490	0.01042	515	0.02549	540	0.03648	565	0.04876
491	0.01084	516	0.02600	541	0.03695	566	0.04929
492	0.01129	517	0.02656	542	0.03732	567	0.05000
493	0.01175	518	0.02704	543	0.03783	568	0.05064
494	0.01223	519	0.02754	544	0.03832	569	0.05140
495	0.01282	520	0.02814	545	0.03869	570	0.05217
496	0.01332	521	0.02863	546	0.03907	571	0.05288
497	0.01399	522	0.02916	547	0.03942	572	0.05366
498	0.01456	523	0.02976	548	0.03977	573	0.05452
499	0.01520	524	0.03023	549	0.04020	574	0.05525
500	0.01590	525	0.03071	550	0.04062	575	0.05591
501	0.01657	526	0.03110	551	0.04118	576	0.05678
502	0.01721	527	0.03150	552	0.04158	577	0.05741
503	0.01792	528	0.03193	553	0.04218	578	0.05803
504	0.01858	529	0.03228	554	0.04253	579	0.05879



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 LAB CODE: 200899-0

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	0.05938	605	0.07133	630	0.06271	655	0.04060
581	0.06013	606	0.07155	631	0.06195	656	0.03969
582	0.06089	607	0.07147	632	0.06127	657	0.03879
583	0.06146	608	0.07137	633	0.06070	658	0.03788
584	0.06215	609	0.07155	634	0.05980	659	0.03700
585	0.06298	610	0.07153	635	0.05899	660	0.03608
586	0.06351	611	0.07146	636	0.05830	661	0.03521
587	0.06424	612	0.07121	637	0.05736	662	0.03434
588	0.06495	613	0.07100	638	0.05642	663	0.03351
589	0.06541	614	0.07061	639	0.05561	664	0.03262
590	0.06603	615	0.07018	640	0.05473	665	0.03183
591	0.06651	616	0.06990	641	0.05383	666	0.03099
592	0.06698	617	0.06955	642	0.05300	667	0.03023
593	0.06759	618	0.06931	643	0.05205	668	0.02942
594	0.06808	619	0.06905	644	0.05109	669	0.02865
595	0.06859	620	0.06859	645	0.05007	670	0.02791
596	0.06899	621	0.06804	646	0.04923	671	0.02722
597	0.06934	622	0.06754	647	0.04828	672	0.02651
598	0.06977	623	0.06686	648	0.04725	673	0.02578
599	0.07009	624	0.06632	649	0.04621	674	0.02508
600	0.07034	625	0.06576	650	0.04527	675	0.02439
601	0.07044	626	0.06523	651	0.04443	676	0.02385
602	0.07080	627	0.06462	652	0.04353	677	0.02328
603	0.07100	628	0.06407	653	0.04258	678	0.02262
604	0.07112	629	0.06336	654	0.04157	679	0.02193



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 LAB CODE: 200899-0

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	0.02133	706	0.01009	732	0.00473	758	0.00219
681	0.02068	707	0.00976	733	0.00442	759	0.00230
682	0.02019	708	0.00945	734	0.00426	760	0.00227
683	0.01971	709	0.00917	735	0.00431	761	0.00224
684	0.01919	710	0.00887	736	0.00415	762	0.00217
685	0.01867	711	0.00863	737	0.00411	763	0.00203
686	0.01814	712	0.00845	738	0.00382	764	0.00203
687	0.01762	713	0.00821	739	0.00374	765	0.00192
688	0.01723	714	0.00805	740	0.00355	766	0.00180
689	0.01676	715	0.00783	741	0.00344	767	0.00173
690	0.01631	716	0.00759	742	0.00346	768	0.00155
691	0.01583	717	0.00734	743	0.00344	769	0.00156
692	0.01532	718	0.00706	744	0.00335	770	0.00156
693	0.01495	719	0.00687	745	0.00324	771	0.00156
694	0.01451	720	0.00673	746	0.00316	772	0.00159
695	0.01406	721	0.00648	747	0.00301	773	0.00156
696	0.01362	722	0.00625	748	0.00299	774	0.00152
697	0.01315	723	0.00602	749	0.00282	775	0.00138
698	0.01282	724	0.00594	750	0.00289	776	0.00128
699	0.01245	725	0.00581	751	0.00282	777	0.00127
700	0.01218	726	0.00554	752	0.00272	778	0.00140
701	0.01188	727	0.00527	753	0.00277	779	0.00146
702	0.01150	728	0.00520	754	0.00269	780	0.00150
703	0.01108	729	0.00521	755	0.00257		
704	0.01074	730	0.00519	756	0.00239		
705	0.01035	731	0.00496	757	0.00221		



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

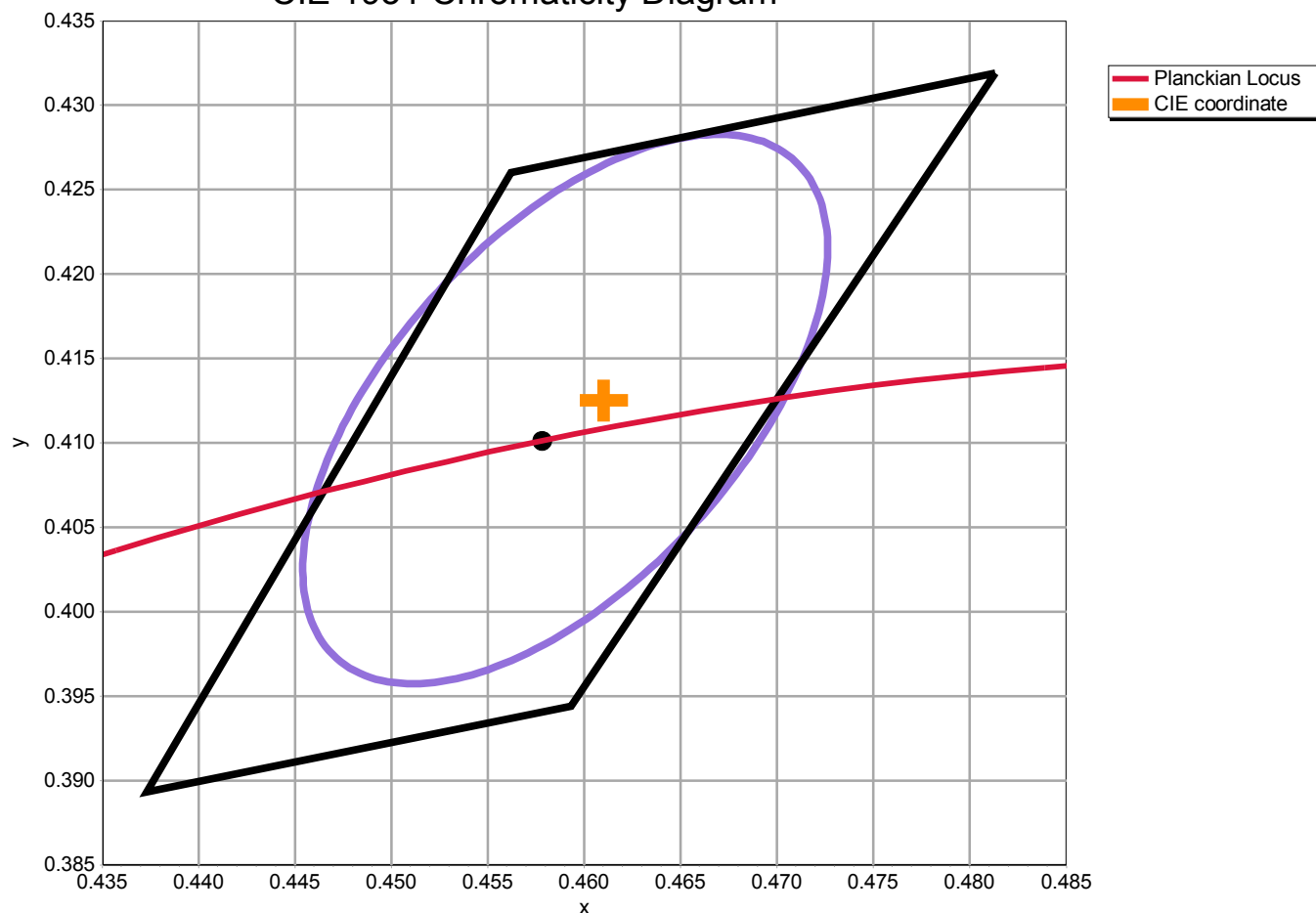
ISO/IEC 17025



NVLAP LAB CODE: 200899-0

CIE Chromaticity Diagram for Indoor SSL products

CIE 1931 Chromaticity Diagram



Chromaticity tolerance for 2700K nominal CCT

Min CCT	2580
Max CCT	2870
Delta T	145
Center Duv	0.0000