



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

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: CY2398	Driver Details: CY963	
Test Report	L1512042-C1	Description	Clusters of 48 Cree XPE2 LED's	Type Commercial
Test Date	4 December 2015	Manufacturer	Cree	Description 61W
Report Date	4 December 2015	Catalog No.	LOGI-HO-120/277-48-40K-10x60-SI-NO	Manufacturer Mean Well
Sphere Temperature	21.1 °C	Serial No.	SRIS 2221	Catalog No. LPF-60-24
Humidity	21.1 %	Diameter	N/A mm	Voltage 120.00 V
Lamp Type	SSL	Color	White	Power Factor 0.9900

Stabilization Time: 10 minutes

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 Spectralux 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



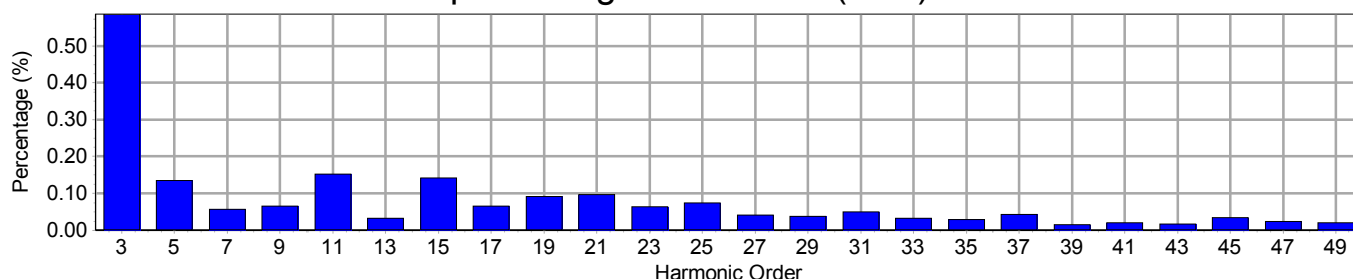
NVLAP LAB CODE: 200899-0

Electrical Measurements

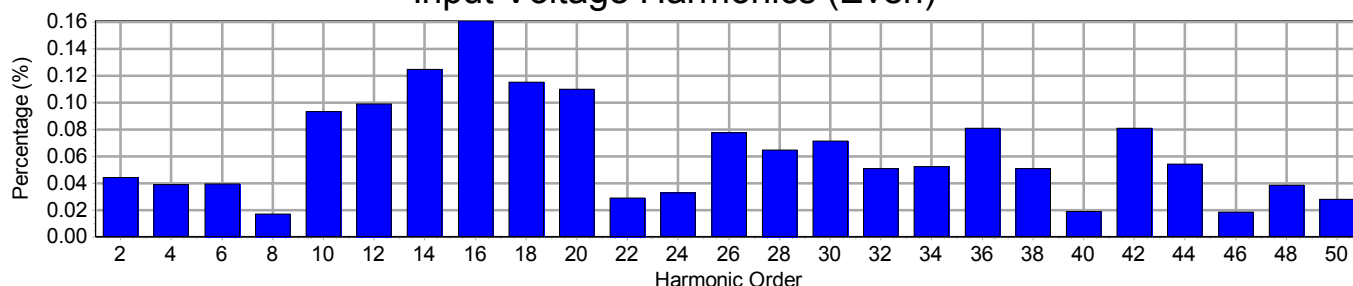
Input

Frequency	60 Hz	Active Power	62.56 W	THDV [ANSI]	0.76 %
Voltage	120.1 V(rms)	Apparent Power	63.00 VA	THDA [ANSI]	4.62 %
Current	0.5247 A(rms)	Power Factor	0.993	Max. Harmonic At	5th order

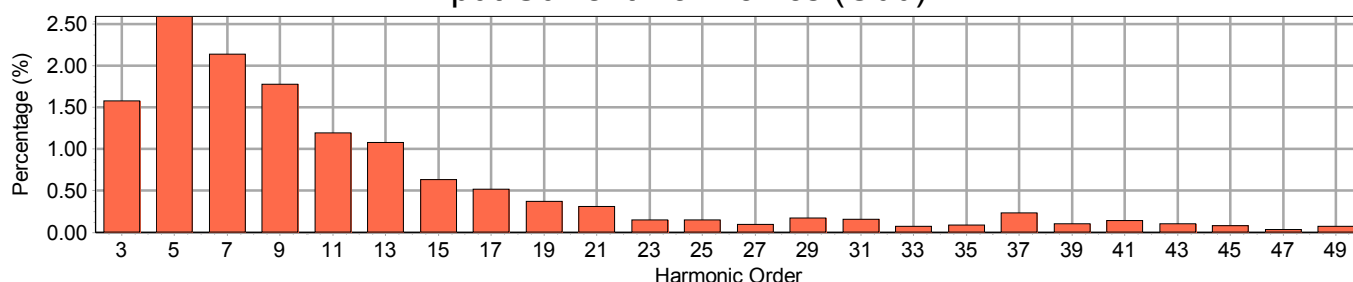
Input Voltage Harmonics (Odd)



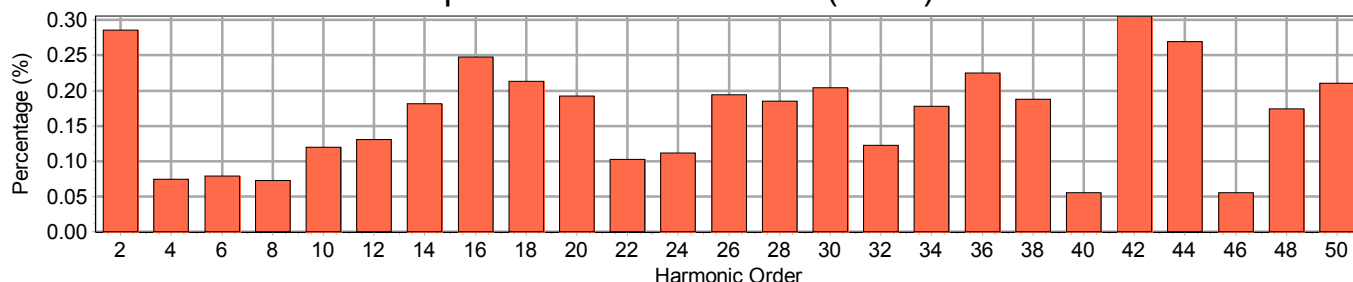
Input Voltage Harmonics (Even)



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	0.044	0.285
3	180	0.588	1.582	4	240	0.039	0.075
5	300	0.134	2.600	6	360	0.039	0.079
7	420	0.056	2.145	8	480	0.017	0.073
9	540	0.066	1.778	10	600	0.093	0.120
11	660	0.153	1.198	12	720	0.099	0.131
13	780	0.032	1.084	14	840	0.125	0.182
15	900	0.141	0.638	16	960	0.161	0.248
17	1020	0.065	0.518	18	1080	0.115	0.213
19	1140	0.092	0.374	20	1200	0.110	0.193
21	1260	0.097	0.313	22	1320	0.029	0.103
23	1380	0.064	0.148	24	1440	0.033	0.112
25	1500	0.073	0.152	26	1560	0.077	0.194
27	1620	0.040	0.095	28	1680	0.065	0.186
29	1740	0.038	0.175	30	1800	0.071	0.204
31	1860	0.050	0.161	32	1920	0.051	0.123
33	1980	0.033	0.069	34	2040	0.052	0.178
35	2100	0.029	0.091	36	2160	0.081	0.225
37	2220	0.042	0.236	38	2280	0.051	0.188
39	2340	0.015	0.106	40	2400	0.019	0.055
41	2460	0.020	0.146	42	2520	0.081	0.306
43	2580	0.017	0.103	44	2640	0.054	0.269
45	2700	0.034	0.084	46	2760	0.019	0.056
47	2820	0.024	0.036	48	2880	0.039	0.174
49	2940	0.020	0.075	50	3000	0.028	0.211



Les Industries Spectralux Inc. Spectralux Industries Inc.

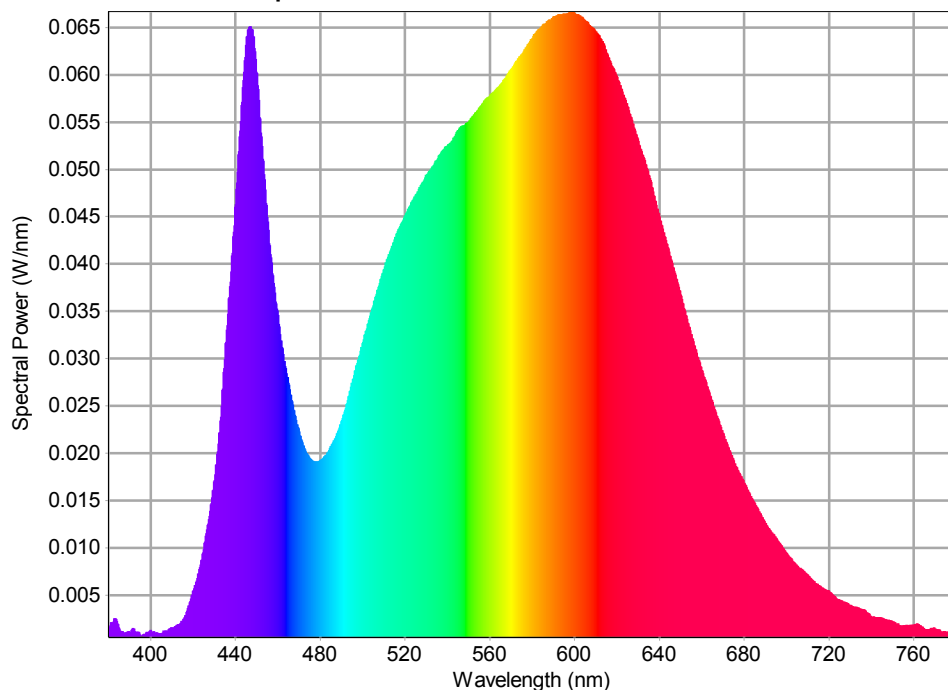
2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca

ISO/IEC 17025



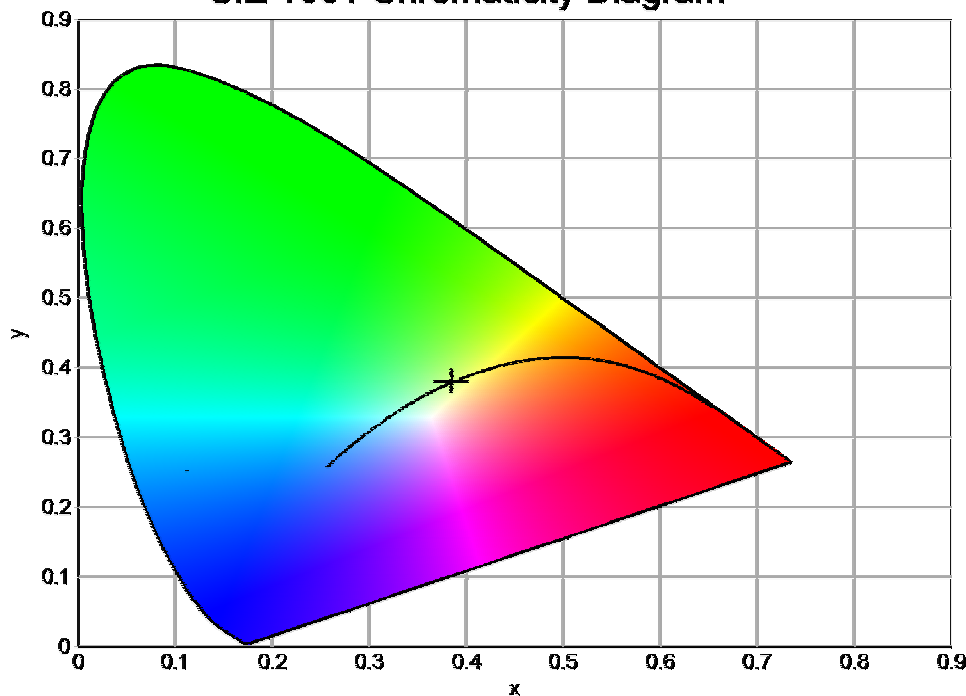
NVLAP LAB CODE: 200899-0

Spectral Power Distribution



Peak Wavelength	600 nm
Luminous Flux	3904 lm
Input Power	62.56 W
Lumens/Watt	62.4
Full Width/Half Maximum	151.88
Center Wavelength	578 nm
Centroid Wavelength	369 nm
Dominant Wavelength	488 nm
Excitation Purity	0.1621
Colorimetric Purity	0.1047

CIE 1931 Chromaticity Diagram



x	0.3842	CCT	3934 K
y	0.3813	CRI	83
u	0.2257	L*	25.67
v	0.3361	a*	-5.10
u'	0.2257	b*	-14.37
v'	0.5041	Duv	0.0010
R1	82.1	R9	14.2
R2	88.0	R10	71.4
R3	92.8	R11	82.9
R4	83.8	R12	65.7
R5	82.1	R13	83.2
R6	83.9	R14	95.8
R7	87.3		
R8	67.5		



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	0.00166	405	0.00101	430	0.01701	455	0.04494
381	0.00177	406	0.00125	431	0.01881	456	0.04218
382	0.00202	407	0.00125	432	0.02102	457	0.04016
383	0.00254	408	0.00121	433	0.02342	458	0.03798
384	0.00230	409	0.00147	434	0.02671	459	0.03601
385	0.00156	410	0.00162	435	0.02997	460	0.03464
386	0.00120	411	0.00159	436	0.03304	461	0.03259
387	0.00103	412	0.00180	437	0.03635	462	0.03125
388	0.00105	413	0.00192	438	0.03918	463	0.02974
389	0.00115	414	0.00200	439	0.04295	464	0.02847
390	0.00114	415	0.00229	440	0.04603	465	0.02744
391	0.00130	416	0.00270	441	0.04980	466	0.02620
392	0.00147	417	0.00325	442	0.05346	467	0.02512
393	0.00105	418	0.00389	443	0.05678	468	0.02407
394	0.00110	419	0.00467	444	0.06033	469	0.02306
395	0.00086	420	0.00542	445	0.06316	470	0.02232
396	0.00065	421	0.00605	446	0.06478	471	0.02150
397	0.00094	422	0.00682	447	0.06516	472	0.02084
398	0.00108	423	0.00777	448	0.06477	473	0.02021
399	0.00107	424	0.00867	449	0.06283	474	0.01987
400	0.00131	425	0.00987	450	0.06031	475	0.01950
401	0.00110	426	0.01125	451	0.05731	476	0.01929
402	0.00094	427	0.01243	452	0.05393	477	0.01915
403	0.00109	428	0.01389	453	0.05110	478	0.01913
404	0.00100	429	0.01536	454	0.04784	479	0.01915



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	0.01927	505	0.03565	530	0.04940	555	0.05650
481	0.01939	506	0.03649	531	0.04971	556	0.05679
482	0.01967	507	0.03724	532	0.04994	557	0.05709
483	0.01989	508	0.03796	533	0.05031	558	0.05744
484	0.02023	509	0.03873	534	0.05074	559	0.05759
485	0.02073	510	0.03939	535	0.05098	560	0.05775
486	0.02114	511	0.04013	536	0.05147	561	0.05806
487	0.02154	512	0.04079	537	0.05179	562	0.05823
488	0.02212	513	0.04134	538	0.05208	563	0.05848
489	0.02270	514	0.04189	539	0.05240	564	0.05872
490	0.02336	515	0.04258	540	0.05257	565	0.05898
491	0.02405	516	0.04318	541	0.05275	566	0.05926
492	0.02481	517	0.04370	542	0.05296	567	0.05959
493	0.02561	518	0.04419	543	0.05334	568	0.05988
494	0.02653	519	0.04459	544	0.05373	569	0.06033
495	0.02743	520	0.04513	545	0.05415	570	0.06059
496	0.02827	521	0.04559	546	0.05446	571	0.06087
497	0.02925	522	0.04606	547	0.05465	572	0.06131
498	0.02991	523	0.04652	548	0.05466	573	0.06154
499	0.03079	524	0.04691	549	0.05490	574	0.06193
500	0.03163	525	0.04734	550	0.05500	575	0.06213
501	0.03250	526	0.04764	551	0.05538	576	0.06249
502	0.03320	527	0.04813	552	0.05564	577	0.06286
503	0.03409	528	0.04855	553	0.05598	578	0.06320
504	0.03491	529	0.04885	554	0.05620	579	0.06357



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	0.06386	605	0.06572	630	0.05299	655	0.03258
581	0.06428	606	0.06560	631	0.05222	656	0.03181
582	0.06457	607	0.06524	632	0.05158	657	0.03103
583	0.06482	608	0.06508	633	0.05096	658	0.03021
584	0.06496	609	0.06492	634	0.05019	659	0.02959
585	0.06532	610	0.06460	635	0.04945	660	0.02882
586	0.06539	611	0.06430	636	0.04866	661	0.02811
587	0.06564	612	0.06390	637	0.04765	662	0.02749
588	0.06585	613	0.06360	638	0.04674	663	0.02677
589	0.06578	614	0.06309	639	0.04586	664	0.02607
590	0.06615	615	0.06237	640	0.04505	665	0.02538
591	0.06622	616	0.06189	641	0.04417	666	0.02469
592	0.06630	617	0.06129	642	0.04335	667	0.02401
593	0.06637	618	0.06080	643	0.04256	668	0.02341
594	0.06637	619	0.06031	644	0.04178	669	0.02278
595	0.06648	620	0.05976	645	0.04091	670	0.02216
596	0.06649	621	0.05922	646	0.04011	671	0.02150
597	0.06651	622	0.05859	647	0.03925	672	0.02096
598	0.06666	623	0.05790	648	0.03848	673	0.02036
599	0.06669	624	0.05736	649	0.03761	674	0.01981
600	0.06653	625	0.05668	650	0.03680	675	0.01923
601	0.06636	626	0.05590	651	0.03589	676	0.01866
602	0.06630	627	0.05522	652	0.03500	677	0.01821
603	0.06617	628	0.05442	653	0.03420	678	0.01779
604	0.06592	629	0.05375	654	0.03338	679	0.01732



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	0.01688	706	0.00784	732	0.00376	758	0.00184
681	0.01644	707	0.00776	733	0.00373	759	0.00186
682	0.01594	708	0.00758	734	0.00367	760	0.00185
683	0.01549	709	0.00737	735	0.00358	761	0.00195
684	0.01507	710	0.00716	736	0.00349	762	0.00196
685	0.01470	711	0.00687	737	0.00341	763	0.00178
686	0.01428	712	0.00665	738	0.00313	764	0.00164
687	0.01386	713	0.00646	739	0.00299	765	0.00140
688	0.01341	714	0.00622	740	0.00271	766	0.00139
689	0.01303	715	0.00609	741	0.00273	767	0.00141
690	0.01264	716	0.00592	742	0.00264	768	0.00150
691	0.01221	717	0.00579	743	0.00266	769	0.00148
692	0.01194	718	0.00562	744	0.00267	770	0.00149
693	0.01162	719	0.00551	745	0.00259	771	0.00140
694	0.01139	720	0.00546	746	0.00245	772	0.00138
695	0.01105	721	0.00522	747	0.00242	773	0.00114
696	0.01070	722	0.00496	748	0.00238	774	0.00121
697	0.01042	723	0.00476	749	0.00229	775	0.00114
698	0.01008	724	0.00460	750	0.00221	776	0.00114
699	0.00977	725	0.00448	751	0.00212	777	0.00126
700	0.00944	726	0.00441	752	0.00196	778	0.00126
701	0.00912	727	0.00428	753	0.00183	779	0.00139
702	0.00891	728	0.00422	754	0.00177	780	0.00146
703	0.00857	729	0.00407	755	0.00179		
704	0.00837	730	0.00398	756	0.00177		
705	0.00811	731	0.00386	757	0.00180		



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

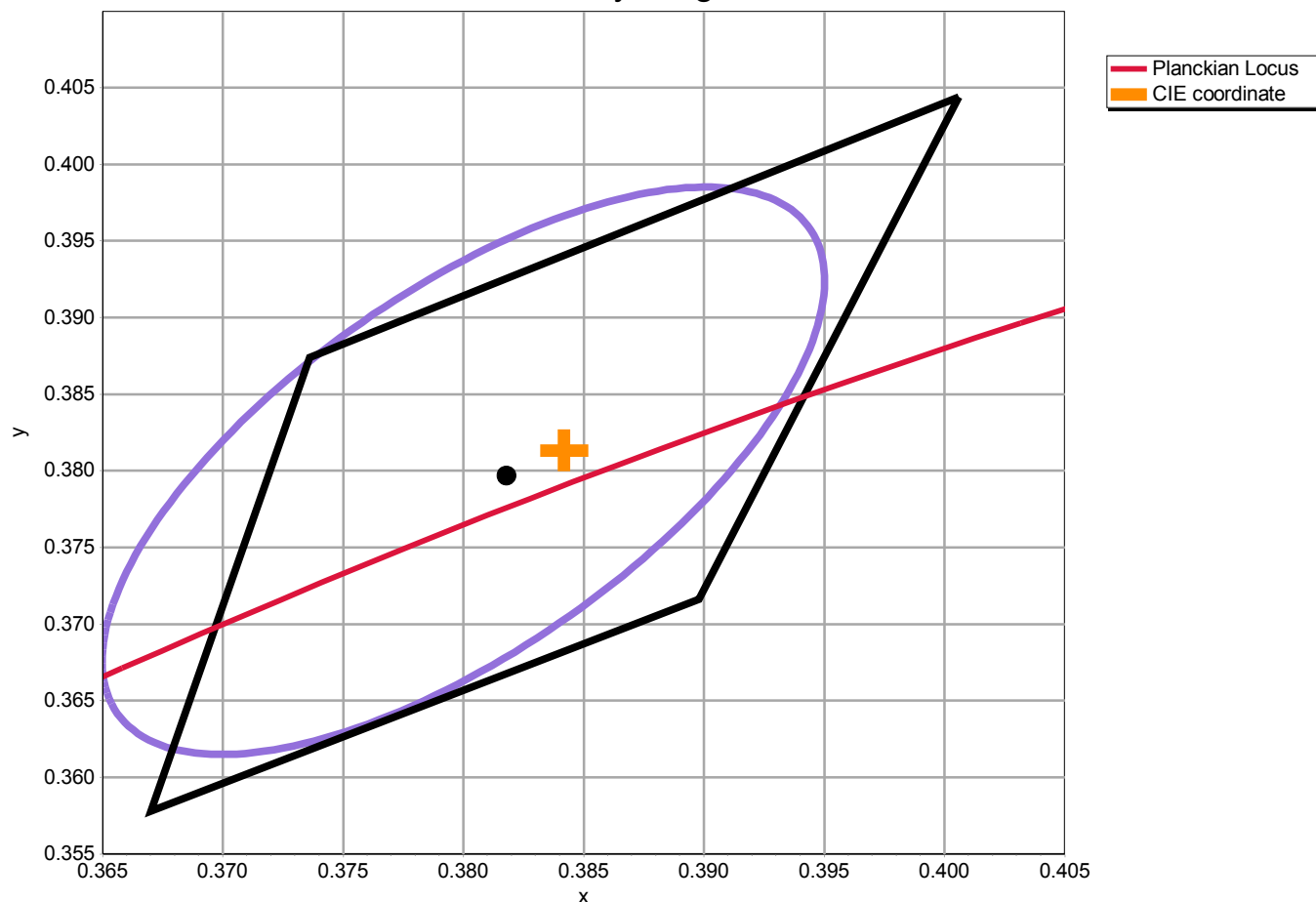
ISO/IEC 17025



NVLAP LAB CODE: 200899-0

CIE Chromaticity Diagram for Indoor SSL products

CIE 1931 Chromaticity Diagram



Chromaticity tolerance for 4000K nominal CCT

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