



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: CY2240	Driver Details: CY963	
Test Report	L1507283-C1	Description	CREE XPE2 LED's	Type Commercial
Test Date	28 July 2015	Manufacturer	Cree	Description 61W
Report Date	28 July 2015	Catalog No.	LOGI-HO-120-48-40K-WWLF-WH-NO	Manufacturer Mean Well
Sphere Temperature	25.0 °C	Serial No.	SRIS 2090	Catalog No. LPF-60-24
Humidity	39.9 %	Diameter	N/A mm	Voltage 120.00 V
Lamp Type	SSL	Color	White	Power Factor 0.9900

Stabilization Time: 10 min

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 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.



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

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	Elgar	CW801	30527	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	91L236540	2014/10/22	2015/10/22
Output Power Meter	N/A	N/A	N/A	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	4282317	2014/10/31	2015/10/31

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



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



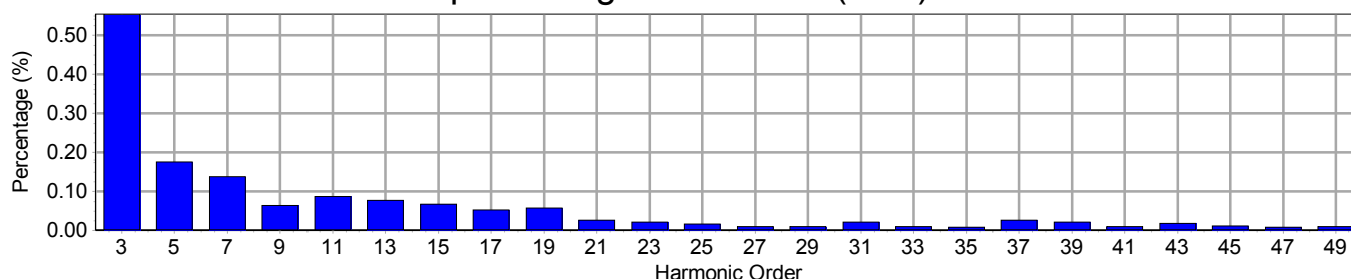
NVLAP LAB CODE: 200899-0

Electrical Measurements

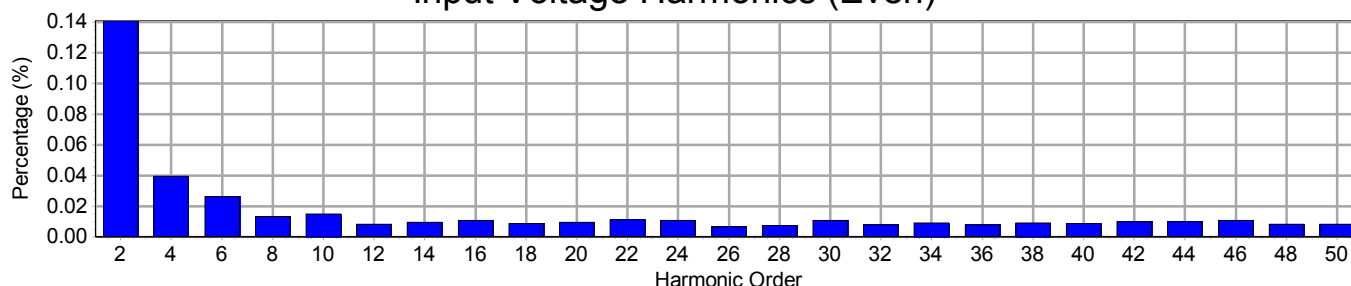
Input

Frequency	60 Hz	Active Power	61.57 W	THDV [ANSI]	0.64 %
Voltage	119.9 V(rms)	Apparent Power	61.87 VA	THDA [ANSI]	5.55 %
Current	0.5160 A(rms)	Power Factor	0.995	Max. Harmonic At	5th order

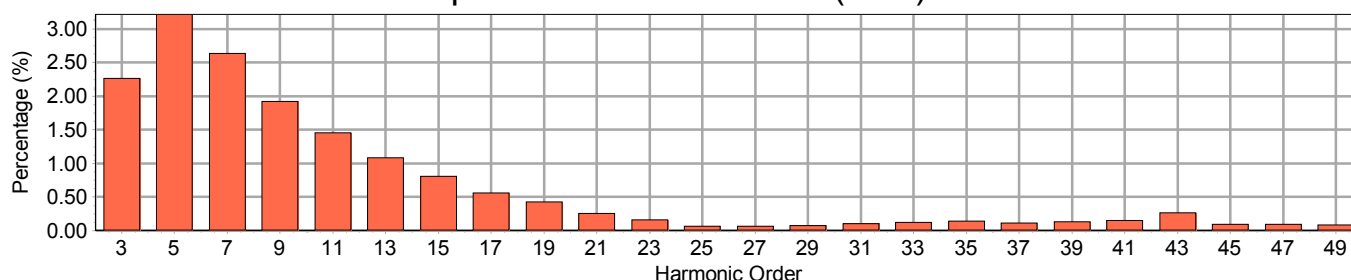
Input Voltage Harmonics (Odd)



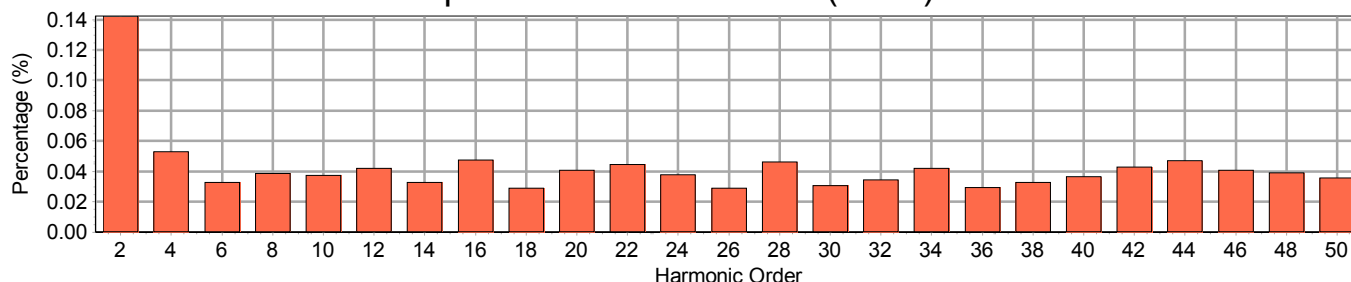
Input Voltage Harmonics (Even)



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	0.141	0.143
3	180	0.555	2.267	4	240	0.040	0.053
5	300	0.174	3.222	6	360	0.026	0.033
7	420	0.138	2.631	8	480	0.013	0.039
9	540	0.064	1.923	10	600	0.015	0.037
11	660	0.087	1.458	12	720	0.008	0.042
13	780	0.076	1.082	14	840	0.010	0.033
15	900	0.066	0.803	16	960	0.011	0.047
17	1020	0.052	0.556	18	1080	0.008	0.029
19	1140	0.056	0.426	20	1200	0.009	0.041
21	1260	0.025	0.251	22	1320	0.011	0.045
23	1380	0.021	0.161	24	1440	0.011	0.038
25	1500	0.016	0.058	26	1560	0.007	0.029
27	1620	0.009	0.064	28	1680	0.007	0.046
29	1740	0.009	0.075	30	1800	0.011	0.031
31	1860	0.021	0.104	32	1920	0.008	0.034
33	1980	0.010	0.118	34	2040	0.009	0.042
35	2100	0.008	0.139	36	2160	0.008	0.030
37	2220	0.025	0.112	38	2280	0.009	0.033
39	2340	0.020	0.131	40	2400	0.009	0.037
41	2460	0.010	0.144	42	2520	0.010	0.043
43	2580	0.017	0.263	44	2640	0.010	0.047
45	2700	0.010	0.089	46	2760	0.011	0.041
47	2820	0.008	0.086	48	2880	0.008	0.039
49	2940	0.010	0.078	50	3000	0.008	0.036



Les Industries Spectralux Inc. Spectralux Industries Inc.

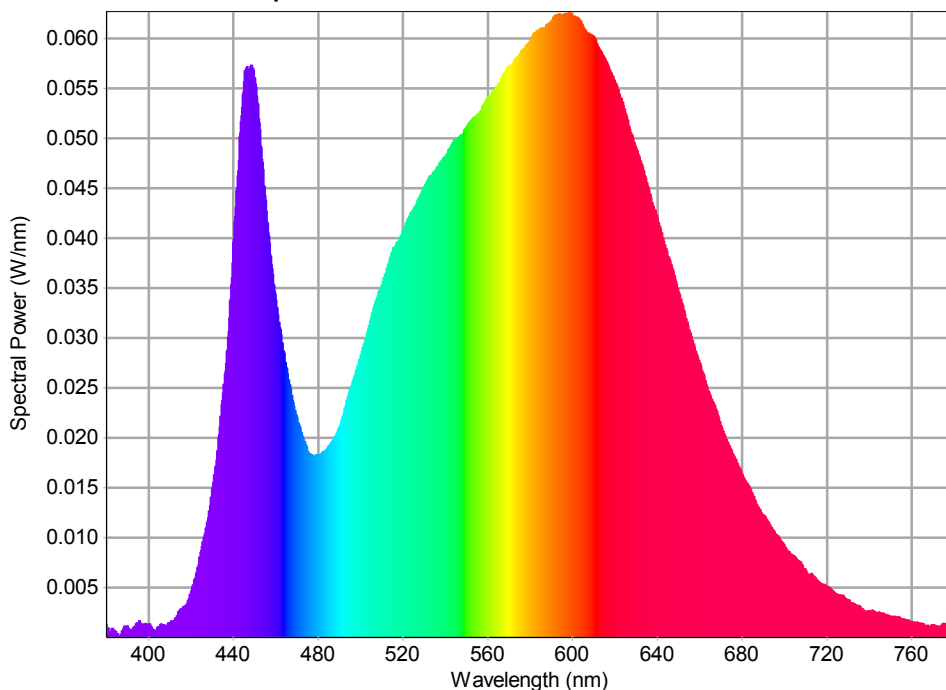
2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca

ISO/IEC 17025



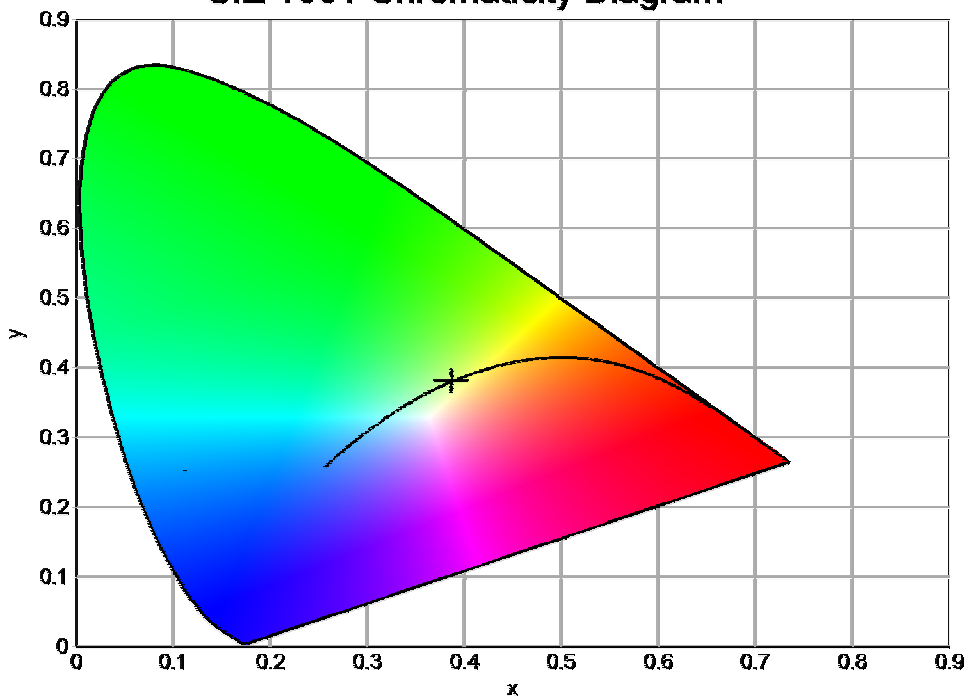
NVLAP LAB CODE: 200899-0

Spectral Power Distribution



Peak Wavelength	598 nm
Luminous Flux	3628 lm
Input Power	61.57 W
Lumens/Watt	58.9
Full Width/Half Maximum	150.42
Center Wavelength	579 nm
Centroid Wavelength	371 nm
Dominant Wavelength	488 nm
Excitation Purity	0.1573
Colorimetric Purity	0.1011

CIE 1931 Chromaticity Diagram



x	0.3861	CCT	3888 K
y	0.3820	CRI	83
u	0.2267	L*	25.67
v	0.3365	a*	-4.91
u'	0.2267	b*	-14.00
v'	0.5047	Duv	0.0008
R1	81.4	R9	12.6
R2	88.1	R10	71.5
R3	93.2	R11	81.3
R4	82.8	R12	64.6
R5	81.4	R13	82.8
R6	83.7	R14	96.1
R7	87.0		
R8	66.5		



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	0.00130	405	0.00112	430	0.01493	455	0.04433
381	0.00100	406	0.00138	431	0.01632	456	0.04170
382	0.00056	407	0.00128	432	0.01780	457	0.03959
383	0.00091	408	0.00114	433	0.02005	458	0.03736
384	0.00075	409	0.00144	434	0.02214	459	0.03544
385	0.00040	410	0.00141	435	0.02454	460	0.03382
386	0.00020	411	0.00167	436	0.02639	461	0.03237
387	0.00035	412	0.00172	437	0.02869	462	0.03106
388	0.00088	413	0.00202	438	0.03207	463	0.02957
389	0.00113	414	0.00263	439	0.03541	464	0.02853
390	0.00120	415	0.00285	440	0.03963	465	0.02709
391	0.00080	416	0.00300	441	0.04315	466	0.02585
392	0.00074	417	0.00317	442	0.04628	467	0.02496
393	0.00111	418	0.00336	443	0.05023	468	0.02378
394	0.00136	419	0.00395	444	0.05319	469	0.02282
395	0.00138	420	0.00461	445	0.05572	470	0.02208
396	0.00152	421	0.00528	446	0.05706	471	0.02131
397	0.00129	422	0.00597	447	0.05702	472	0.02062
398	0.00126	423	0.00699	448	0.05727	473	0.01989
399	0.00141	424	0.00803	449	0.05712	474	0.01938
400	0.00125	425	0.00917	450	0.05618	475	0.01871
401	0.00118	426	0.01004	451	0.05433	476	0.01844
402	0.00084	427	0.01097	452	0.05201	477	0.01834
403	0.00070	428	0.01201	453	0.04931	478	0.01813
404	0.00102	429	0.01322	454	0.04692	479	0.01831



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	0.01832	505	0.03219	530	0.04522	555	0.05244
481	0.01835	506	0.03303	531	0.04567	556	0.05263
482	0.01858	507	0.03368	532	0.04606	557	0.05292
483	0.01859	508	0.03431	533	0.04628	558	0.05342
484	0.01888	509	0.03487	534	0.04662	559	0.05381
485	0.01922	510	0.03532	535	0.04679	560	0.05416
486	0.01953	511	0.03608	536	0.04715	561	0.05430
487	0.01982	512	0.03662	537	0.04752	562	0.05467
488	0.02018	513	0.03741	538	0.04775	563	0.05495
489	0.02061	514	0.03815	539	0.04810	564	0.05519
490	0.02113	515	0.03881	540	0.04830	565	0.05556
491	0.02181	516	0.03917	541	0.04864	566	0.05575
492	0.02254	517	0.03959	542	0.04907	567	0.05637
493	0.02332	518	0.03981	543	0.04943	568	0.05665
494	0.02417	519	0.04035	544	0.04980	569	0.05705
495	0.02487	520	0.04086	545	0.04997	570	0.05730
496	0.02551	521	0.04129	546	0.05011	571	0.05736
497	0.02618	522	0.04189	547	0.05033	572	0.05766
498	0.02682	523	0.04227	548	0.05043	573	0.05804
499	0.02758	524	0.04267	549	0.05089	574	0.05823
500	0.02825	525	0.04300	550	0.05121	575	0.05847
501	0.02904	526	0.04337	551	0.05160	576	0.05897
502	0.02972	527	0.04389	552	0.05179	577	0.05906
503	0.03052	528	0.04435	553	0.05209	578	0.05937
504	0.03129	529	0.04473	554	0.05227	579	0.05957



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	0.05986	605	0.06128	630	0.04906	655	0.03085
581	0.06029	606	0.06093	631	0.04850	656	0.03022
582	0.06066	607	0.06062	632	0.04781	657	0.02948
583	0.06083	608	0.06053	633	0.04721	658	0.02876
584	0.06090	609	0.06044	634	0.04633	659	0.02815
585	0.06112	610	0.06028	635	0.04564	660	0.02755
586	0.06105	611	0.05984	636	0.04491	661	0.02677
587	0.06113	612	0.05927	637	0.04411	662	0.02626
588	0.06153	613	0.05891	638	0.04331	663	0.02543
589	0.06161	614	0.05850	639	0.04283	664	0.02476
590	0.06180	615	0.05814	640	0.04203	665	0.02422
591	0.06223	616	0.05775	641	0.04130	666	0.02371
592	0.06243	617	0.05723	642	0.04060	667	0.02329
593	0.06249	618	0.05671	643	0.03976	668	0.02268
594	0.06254	619	0.05629	644	0.03906	669	0.02201
595	0.06236	620	0.05567	645	0.03826	670	0.02130
596	0.06252	621	0.05525	646	0.03776	671	0.02073
597	0.06254	622	0.05455	647	0.03704	672	0.02018
598	0.06275	623	0.05407	648	0.03632	673	0.01964
599	0.06255	624	0.05338	649	0.03547	674	0.01921
600	0.06229	625	0.05258	650	0.03468	675	0.01874
601	0.06234	626	0.05194	651	0.03398	676	0.01823
602	0.06222	627	0.05096	652	0.03326	677	0.01787
603	0.06202	628	0.05040	653	0.03242	678	0.01729
604	0.06173	629	0.04969	654	0.03170	679	0.01690



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	0.01636	706	0.00781	732	0.00349	758	0.00175
681	0.01593	707	0.00766	733	0.00339	759	0.00166
682	0.01552	708	0.00739	734	0.00325	760	0.00155
683	0.01525	709	0.00690	735	0.00323	761	0.00156
684	0.01480	710	0.00675	736	0.00300	762	0.00151
685	0.01433	711	0.00635	737	0.00286	763	0.00147
686	0.01384	712	0.00630	738	0.00266	764	0.00139
687	0.01329	713	0.00630	739	0.00265	765	0.00144
688	0.01293	714	0.00612	740	0.00267	766	0.00120
689	0.01255	715	0.00585	741	0.00271	767	0.00118
690	0.01232	716	0.00564	742	0.00267	768	0.00112
691	0.01207	717	0.00547	743	0.00249	769	0.00121
692	0.01168	718	0.00535	744	0.00247	770	0.00129
693	0.01136	719	0.00530	745	0.00247	771	0.00115
694	0.01098	720	0.00513	746	0.00246	772	0.00118
695	0.01067	721	0.00503	747	0.00237	773	0.00112
696	0.01034	722	0.00485	748	0.00227	774	0.00124
697	0.01015	723	0.00466	749	0.00226	775	0.00143
698	0.00980	724	0.00438	750	0.00215	776	0.00138
699	0.00951	725	0.00434	751	0.00209	777	0.00116
700	0.00917	726	0.00432	752	0.00214	778	0.00094
701	0.00885	727	0.00420	753	0.00210	779	0.00080
702	0.00864	728	0.00411	754	0.00206	780	0.00096
703	0.00838	729	0.00391	755	0.00187		
704	0.00824	730	0.00381	756	0.00190		
705	0.00811	731	0.00354	757	0.00182		



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

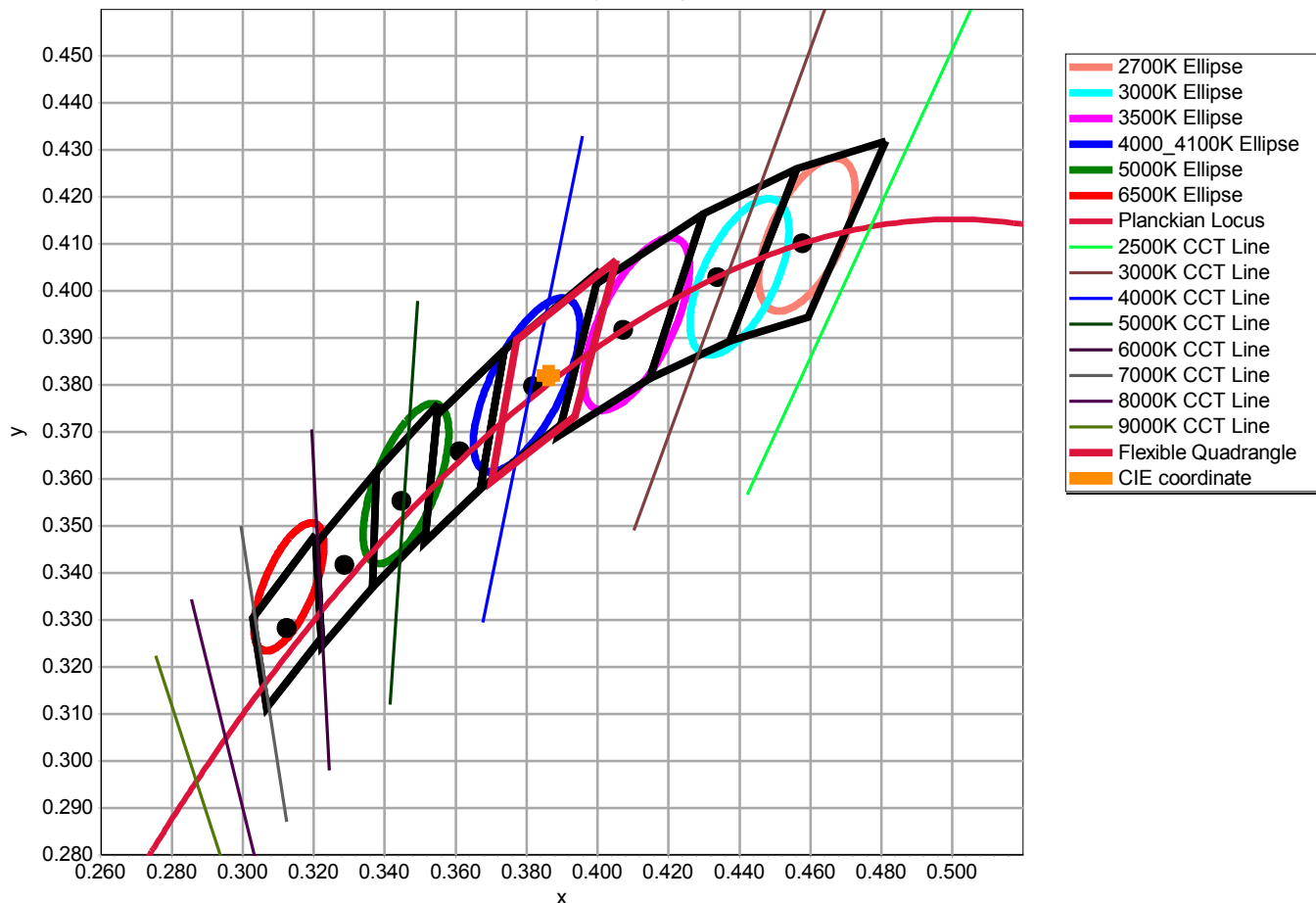
ISO/IEC 17025



NVLAP LAB CODE: 200899-0

CIE Chromaticity Diagram for Indoor SSL products

CIE 1931 Chromaticity Diagram



Chromaticity tolerance of Flexible CCT at nominal CCT of 3900K

		x		y	
		Center Point		0.3856	0.3818
Min CCT	3626	Tolerance	A	0.4052	0.4066
Max CCT	4174		B	0.3773	0.3896
Delta T	274		C	0.3701	0.3595
Center Duv	0.0009	Quadrangle	D	0.3937	0.3734