



# 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](http://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: CY2387	Driver Details: CY963	
<b>Test Report</b>	L1511272-C1	<b>Description</b>	Clusters of 48 Cree XPE2 LED's	<b>Type</b> Commercial
<b>Test Date</b>	27 November 2015	<b>Manufacturer</b>	Cree	<b>Description</b> 61W
<b>Report Date</b>	8 December 2015	<b>Catalog No.</b>	LOG-HO-120-48-35K-60x60-SI-NO	<b>Manufacturer</b> Mean Well
<b>Sphere Temperature</b>	23.0 °C	<b>Serial No.</b>	SRIS 2217	<b>Catalog No.</b> LPF-60-24
<b>Humidity</b>	27.4 %	<b>Diameter</b>	N/A mm	<b>Voltage</b> 120.00 V
<b>Lamp Type</b>	SSL	<b>Color</b>	White	<b>Power Factor</b> 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.

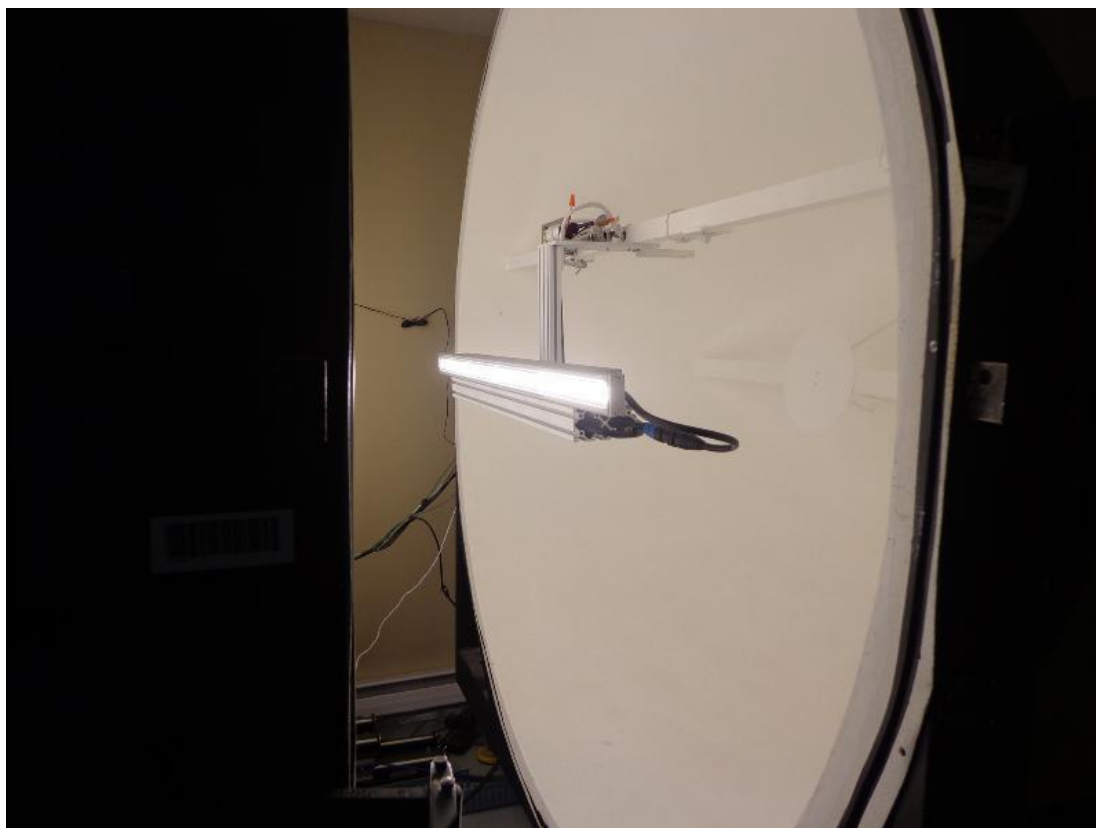


## Realization of Sphere Test

A  $4\pi$  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](http://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](http://www.spectralux.ca)

ISO/IEC 17025



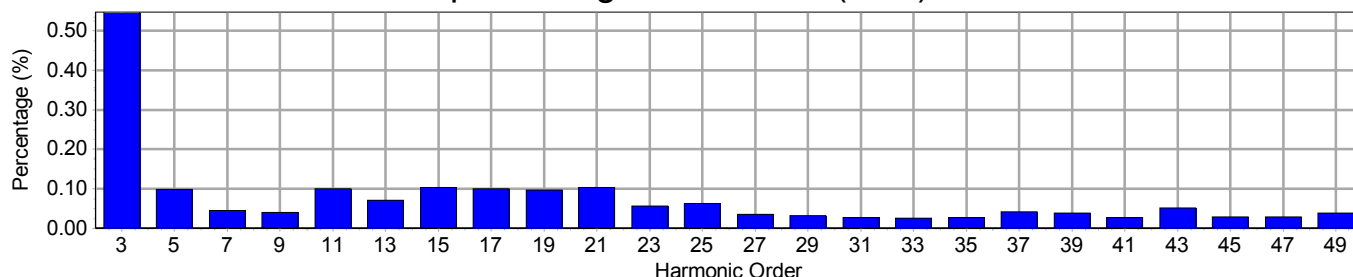
NVLAP LAB CODE: 200899-0

## Electrical Measurements

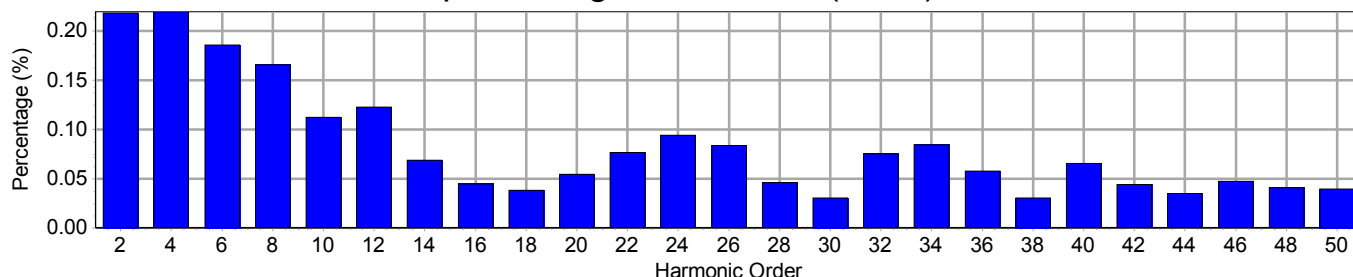
### Input

Frequency	60 Hz	Active Power	61.06 W	THDV [ANSI]	0.79 %
Voltage	120.1 V(rms)	Apparent Power	61.56 VA	THDA [ANSI]	5.62 %
Current	0.5124 A(rms)	Power Factor	0.992	Max. Harmonic At	5th order

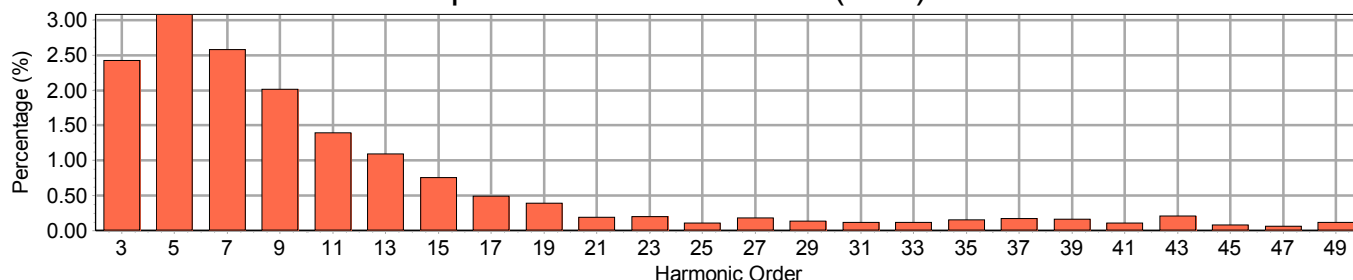
### Input Voltage Harmonics (Odd)



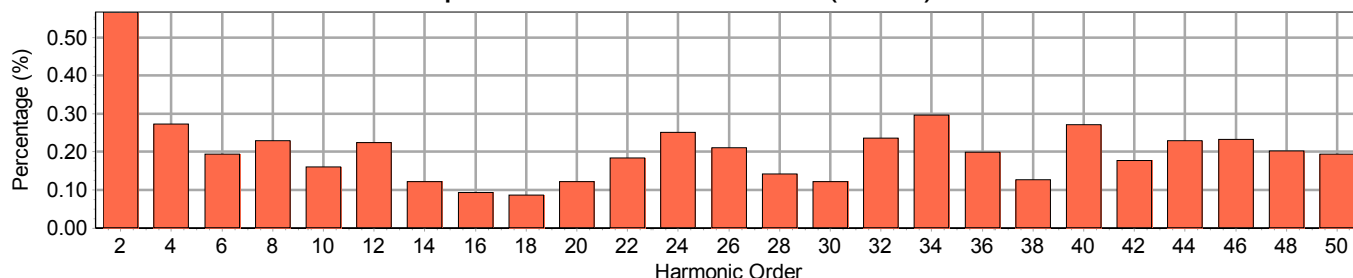
### Input Voltage Harmonics (Even)



### 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](http://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	0.218	0.567
3	180	0.548	2.430	4	240	0.220	0.273
5	300	0.098	3.089	6	360	0.186	0.194
7	420	0.045	2.582	8	480	0.166	0.228
9	540	0.040	2.011	10	600	0.112	0.160
11	660	0.101	1.396	12	720	0.123	0.223
13	780	0.071	1.094	14	840	0.069	0.121
15	900	0.103	0.755	16	960	0.045	0.094
17	1020	0.100	0.491	18	1080	0.038	0.087
19	1140	0.097	0.389	20	1200	0.055	0.122
21	1260	0.104	0.188	22	1320	0.076	0.184
23	1380	0.056	0.193	24	1440	0.094	0.251
25	1500	0.062	0.103	26	1560	0.084	0.211
27	1620	0.035	0.180	28	1680	0.046	0.141
29	1740	0.031	0.132	30	1800	0.030	0.122
31	1860	0.027	0.116	32	1920	0.075	0.236
33	1980	0.025	0.112	34	2040	0.085	0.296
35	2100	0.027	0.152	36	2160	0.058	0.199
37	2220	0.041	0.171	38	2280	0.030	0.126
39	2340	0.038	0.161	40	2400	0.066	0.271
41	2460	0.027	0.106	42	2520	0.044	0.177
43	2580	0.051	0.204	44	2640	0.035	0.230
45	2700	0.029	0.080	46	2760	0.047	0.232
47	2820	0.028	0.064	48	2880	0.041	0.202
49	2940	0.037	0.112	50	3000	0.040	0.194



# Les Industries Spectralux Inc. Spectralux Industries Inc.

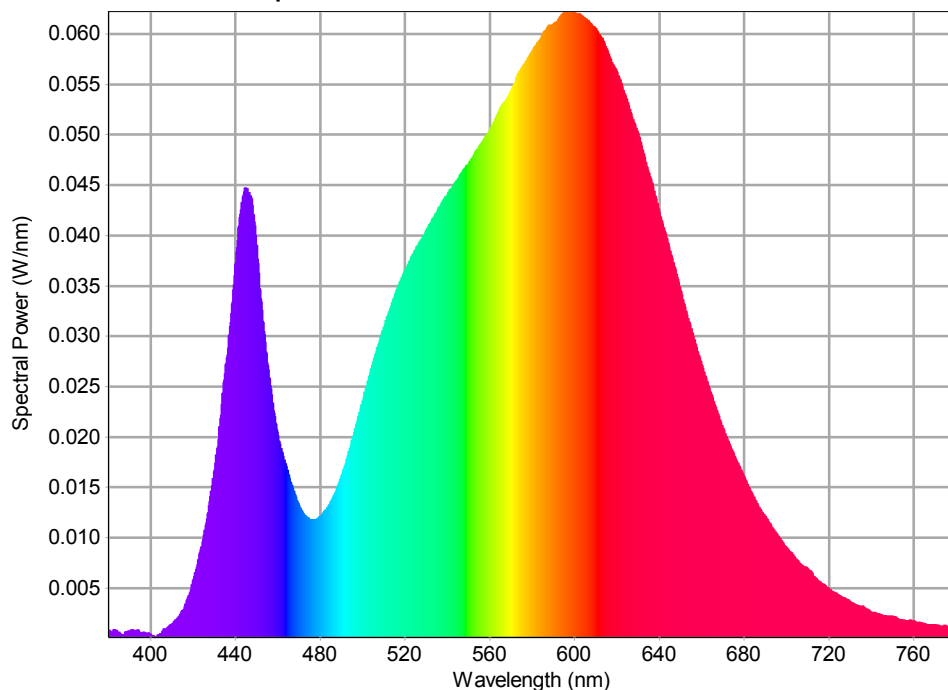
2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada  
Tel.: (514) 332-0082 Fax: (514) 332-3590 [www.spectralux.ca](http://www.spectralux.ca)

ISO/IEC 17025



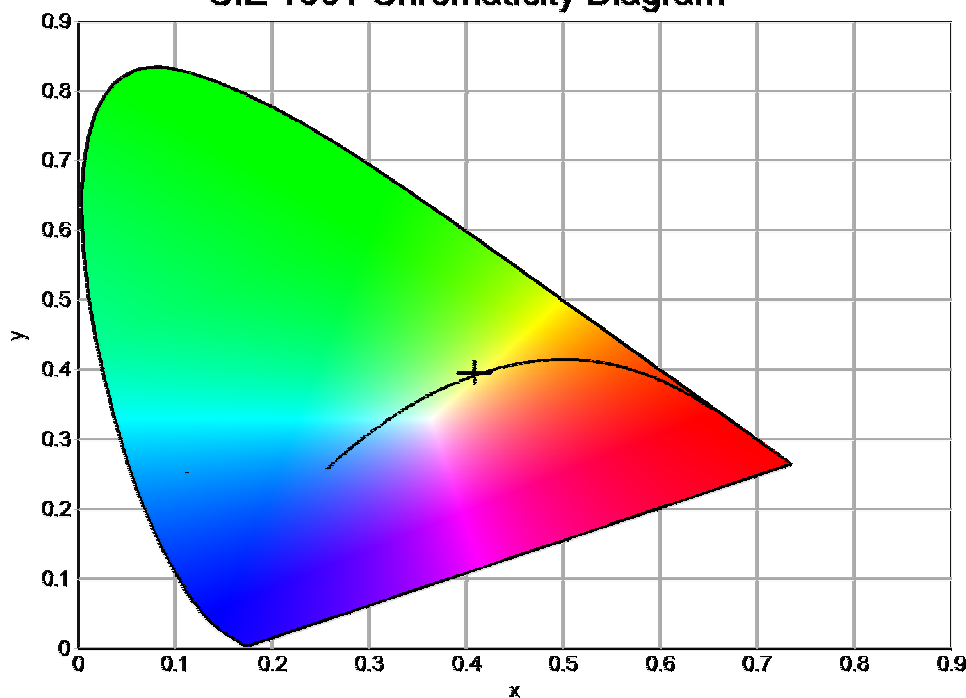
NVLAP LAB CODE: 200899-0

## Spectral Power Distribution



Peak Wavelength	596 nm
Luminous Flux	3421 lm
Input Power	61.06 W
Lumens/Watt	56.0
Full Width/Half Maximum	144.15
Center Wavelength	582 nm
Centroid Wavelength	383 nm
Dominant Wavelength	490 nm
Excitation Purity	0.0990
Colorimetric Purity	0.0730

## CIE 1931 Chromaticity Diagram



x	0.4078	CCT	3488 K
y	0.3960	CRI	81
u	0.2352	L*	25.67
v	0.3425	a*	-3.82
u'	0.2352	b*	-8.38
v'	0.5138	Duv	0.0018
R1	79.0	R9	4.6
R2	86.0	R10	67.3
R3	92.4	R11	79.9
R4	81.2	R12	64.0
R5	78.9	R13	80.1
R6	81.5	R14	95.5
R7	85.3		
R8	62.4		



# 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](http://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	0.00055	405	0.00052	430	0.01661	455	0.02742
381	0.00075	406	0.00099	431	0.01827	456	0.02595
382	0.00075	407	0.00100	432	0.01978	457	0.02426
383	0.00090	408	0.00114	433	0.02191	458	0.02266
384	0.00088	409	0.00135	434	0.02436	459	0.02145
385	0.00069	410	0.00150	435	0.02635	460	0.02017
386	0.00048	411	0.00172	436	0.02791	461	0.01934
387	0.00041	412	0.00190	437	0.03008	462	0.01857
388	0.00068	413	0.00215	438	0.03233	463	0.01775
389	0.00072	414	0.00246	439	0.03465	464	0.01710
390	0.00076	415	0.00280	440	0.03712	465	0.01636
391	0.00092	416	0.00321	441	0.03952	466	0.01558
392	0.00079	417	0.00379	442	0.04181	467	0.01496
393	0.00083	418	0.00429	443	0.04327	468	0.01439
394	0.00089	419	0.00492	444	0.04437	469	0.01373
395	0.00063	420	0.00580	445	0.04476	470	0.01326
396	0.00057	421	0.00657	446	0.04427	471	0.01280
397	0.00067	422	0.00737	447	0.04399	472	0.01246
398	0.00055	423	0.00844	448	0.04303	473	0.01221
399	0.00060	424	0.00910	449	0.04136	474	0.01205
400	0.00048	425	0.01032	450	0.03913	475	0.01188
401	0.00036	426	0.01129	451	0.03631	476	0.01183
402	0.00020	427	0.01243	452	0.03377	477	0.01182
403	0.00030	428	0.01411	453	0.03153	478	0.01188
404	0.00039	429	0.01521	454	0.02947	479	0.01197



**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](http://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	0.01216	505	0.02751	530	0.04055	555	0.04890
481	0.01236	506	0.02822	531	0.04092	556	0.04921
482	0.01267	507	0.02896	532	0.04126	557	0.04951
483	0.01289	508	0.02962	533	0.04170	558	0.04989
484	0.01326	509	0.03032	534	0.04205	559	0.05012
485	0.01362	510	0.03089	535	0.04237	560	0.05049
486	0.01405	511	0.03161	536	0.04283	561	0.05091
487	0.01447	512	0.03216	537	0.04317	562	0.05129
488	0.01501	513	0.03278	538	0.04352	563	0.05181
489	0.01558	514	0.03341	539	0.04387	564	0.05227
490	0.01617	515	0.03398	540	0.04410	565	0.05273
491	0.01679	516	0.03461	541	0.04456	566	0.05308
492	0.01747	517	0.03512	542	0.04470	567	0.05332
493	0.01820	518	0.03561	543	0.04504	568	0.05358
494	0.01891	519	0.03614	544	0.04542	569	0.05401
495	0.01972	520	0.03661	545	0.04565	570	0.05443
496	0.02048	521	0.03701	546	0.04607	571	0.05486
497	0.02126	522	0.03742	547	0.04637	572	0.05533
498	0.02207	523	0.03790	548	0.04667	573	0.05597
499	0.02282	524	0.03831	549	0.04696	574	0.05634
500	0.02361	525	0.03869	550	0.04720	575	0.05663
501	0.02446	526	0.03905	551	0.04758	576	0.05704
502	0.02515	527	0.03939	552	0.04784	577	0.05731
503	0.02599	528	0.03975	553	0.04832	578	0.05765
504	0.02676	529	0.04007	554	0.04860	579	0.05803





**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](http://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	0.05835	605	0.06157	630	0.05016	655	0.03079
581	0.05871	606	0.06140	631	0.04939	656	0.03005
582	0.05901	607	0.06123	632	0.04860	657	0.02932
583	0.05932	608	0.06097	633	0.04781	658	0.02855
584	0.05957	609	0.06079	634	0.04693	659	0.02790
585	0.06009	610	0.06058	635	0.04626	660	0.02721
586	0.06037	611	0.06021	636	0.04561	661	0.02649
587	0.06063	612	0.05989	637	0.04487	662	0.02592
588	0.06093	613	0.05963	638	0.04403	663	0.02519
589	0.06086	614	0.05909	639	0.04324	664	0.02453
590	0.06105	615	0.05860	640	0.04232	665	0.02399
591	0.06120	616	0.05812	641	0.04157	666	0.02331
592	0.06136	617	0.05753	642	0.04085	667	0.02269
593	0.06172	618	0.05705	643	0.04016	668	0.02210
594	0.06195	619	0.05669	644	0.03938	669	0.02152
595	0.06221	620	0.05623	645	0.03854	670	0.02093
596	0.06226	621	0.05573	646	0.03779	671	0.02037
597	0.06212	622	0.05518	647	0.03701	672	0.01986
598	0.06224	623	0.05445	648	0.03624	673	0.01938
599	0.06214	624	0.05393	649	0.03541	674	0.01887
600	0.06214	625	0.05326	650	0.03462	675	0.01837
601	0.06207	626	0.05260	651	0.03372	676	0.01786
602	0.06202	627	0.05184	652	0.03294	677	0.01746
603	0.06193	628	0.05129	653	0.03218	678	0.01698
604	0.06170	629	0.05073	654	0.03148	679	0.01652



**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](http://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	0.01610	706	0.00753	732	0.00343	758	0.00185
681	0.01559	707	0.00735	733	0.00337	759	0.00175
682	0.01510	708	0.00717	734	0.00330	760	0.00181
683	0.01471	709	0.00716	735	0.00322	761	0.00167
684	0.01426	710	0.00696	736	0.00325	762	0.00158
685	0.01390	711	0.00678	737	0.00308	763	0.00163
686	0.01346	712	0.00657	738	0.00295	764	0.00153
687	0.01303	713	0.00619	739	0.00284	765	0.00145
688	0.01272	714	0.00598	740	0.00265	766	0.00142
689	0.01242	715	0.00576	741	0.00266	767	0.00139
690	0.01215	716	0.00560	742	0.00257	768	0.00131
691	0.01183	717	0.00546	743	0.00248	769	0.00142
692	0.01149	718	0.00536	744	0.00246	770	0.00142
693	0.01111	719	0.00510	745	0.00239	771	0.00135
694	0.01085	720	0.00494	746	0.00235	772	0.00129
695	0.01052	721	0.00478	747	0.00226	773	0.00121
696	0.01019	722	0.00470	748	0.00227	774	0.00135
697	0.00993	723	0.00457	749	0.00227	775	0.00134
698	0.00960	724	0.00443	750	0.00225	776	0.00116
699	0.00926	725	0.00432	751	0.00220	777	0.00118
700	0.00906	726	0.00418	752	0.00209	778	0.00109
701	0.00879	727	0.00410	753	0.00192	779	0.00104
702	0.00859	728	0.00397	754	0.00192	780	0.00122
703	0.00835	729	0.00388	755	0.00184		
704	0.00806	730	0.00371	756	0.00183		
705	0.00782	731	0.00358	757	0.00182		