



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: CY2814	Driver Details: CY810	
Test Report	L1611157-C1	Description	4 Rows of 12 CREE XPE2 LED's	Type Commercial
Test Date	15 November 2016	Manufacturer	Cree	Description 61W
Report Date	15 November 2016	Catalog No.	LOGi HO-120/277-48-27K-WW-NO	Manufacturer MEAN WELL
Sphere Temperature	24.6°C	Serial No.	SRIS-2590	Catalog No. LPF-60-24
Humidity	39.4 %	Drive Current	300 mA	Voltage 120.00 V
Lamp Type	SSL	Color	2700K	Power Factor 0.9900

Stabilization Time: 1 hour

Tested By: George Hedrei

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.

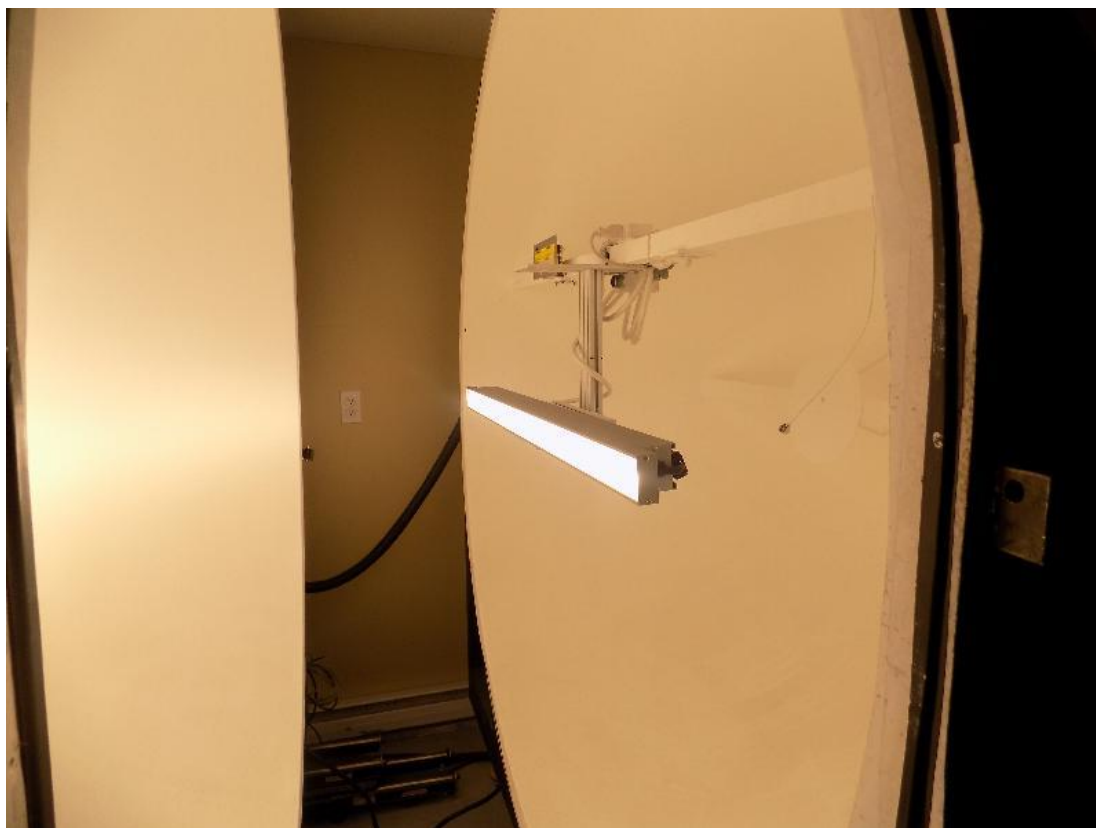


Realization of Sphere Test

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	27E224420	2016/05/06	2017/05/06
Output Power Meter	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.
Shunt Resistor	Fluke	Y5020	5675014	2016/05/05	2017/05/05
Current Multimeter	HP Agilent	HP34401A	MY41025831	2016/05/05	2017/05/05
Voltage Multimeter	HP Agilent	HP34401A	US36010444	2016/05/05	2017/05/05

Spectrometer Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Spectrometer	Ocean Optics	USB2000N	USB2E3364	2016/05/30	2017/05/30

Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	091203915	2014/10/30	2016/11/30



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



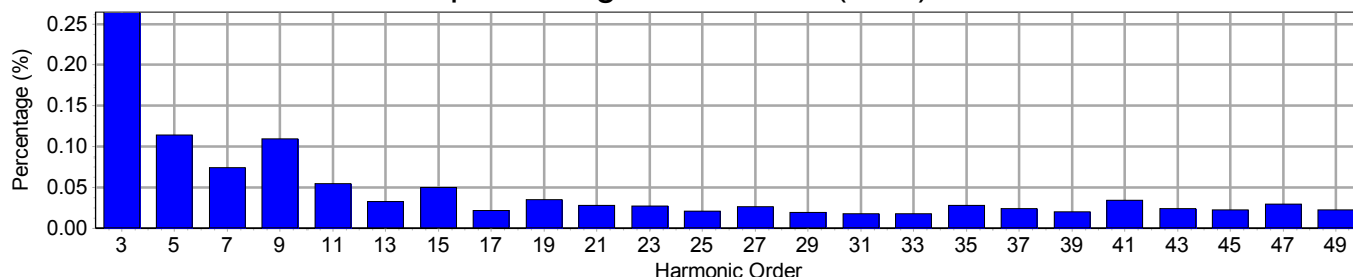
NVLAP LAB CODE: 200899-0

Electrical Measurements

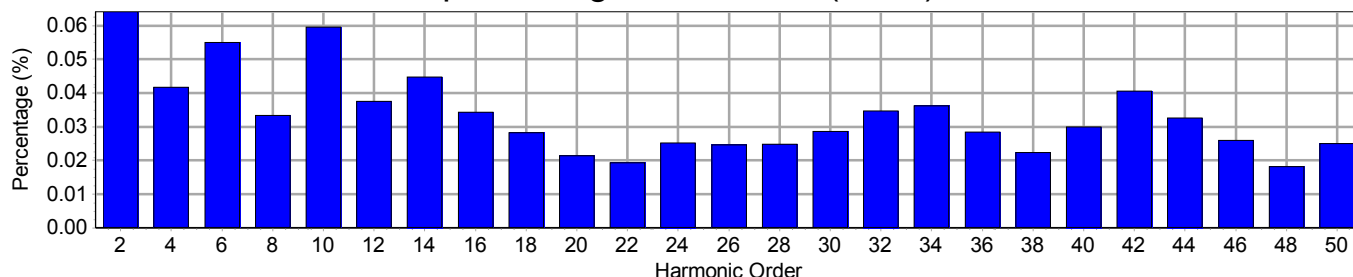
Input

Frequency	60 Hz	Active Power	60.84 W	THDV [ANSI]	0.38 %
Voltage	120.1 V(rms)	Apparent Power	61.22 VA	THDA [ANSI]	4.82 %
Current	0.5098 A(rms)	Power Factor	0.994	Max. Harmonic At	5th order

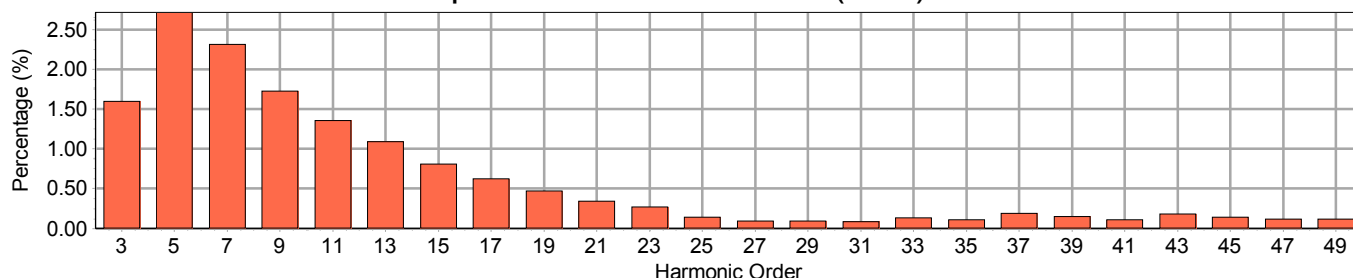
Input Voltage Harmonics (Odd)



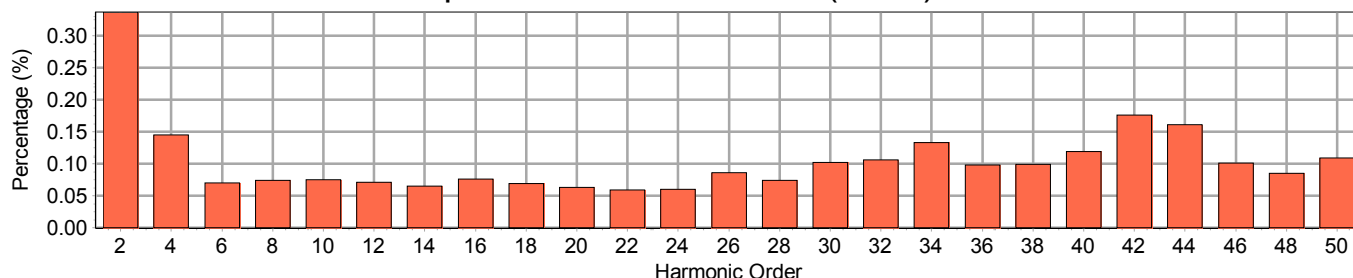
Input Voltage Harmonics (Even)



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	0.064	0.337
3	180	0.265	1.602	4	240	0.042	0.145
5	300	0.114	2.723	6	360	0.055	0.071
7	420	0.074	2.319	8	480	0.033	0.074
9	540	0.110	1.731	10	600	0.060	0.075
11	660	0.054	1.355	12	720	0.037	0.071
13	780	0.033	1.088	14	840	0.045	0.065
15	900	0.049	0.806	16	960	0.034	0.077
17	1020	0.021	0.627	18	1080	0.028	0.069
19	1140	0.035	0.469	20	1200	0.021	0.063
21	1260	0.027	0.342	22	1320	0.019	0.060
23	1380	0.027	0.272	24	1440	0.025	0.060
25	1500	0.021	0.140	26	1560	0.025	0.086
27	1620	0.026	0.096	28	1680	0.025	0.075
29	1740	0.019	0.090	30	1800	0.029	0.103
31	1860	0.018	0.088	32	1920	0.035	0.107
33	1980	0.017	0.132	34	2040	0.036	0.134
35	2100	0.027	0.107	36	2160	0.028	0.098
37	2220	0.024	0.187	38	2280	0.022	0.099
39	2340	0.020	0.149	40	2400	0.030	0.120
41	2460	0.034	0.109	42	2520	0.040	0.176
43	2580	0.024	0.177	44	2640	0.033	0.162
45	2700	0.023	0.142	46	2760	0.026	0.101
47	2820	0.029	0.121	48	2880	0.018	0.086
49	2940	0.022	0.116	50	3000	0.025	0.109



Les Industries Spectralux Inc. Spectralux Industries Inc.

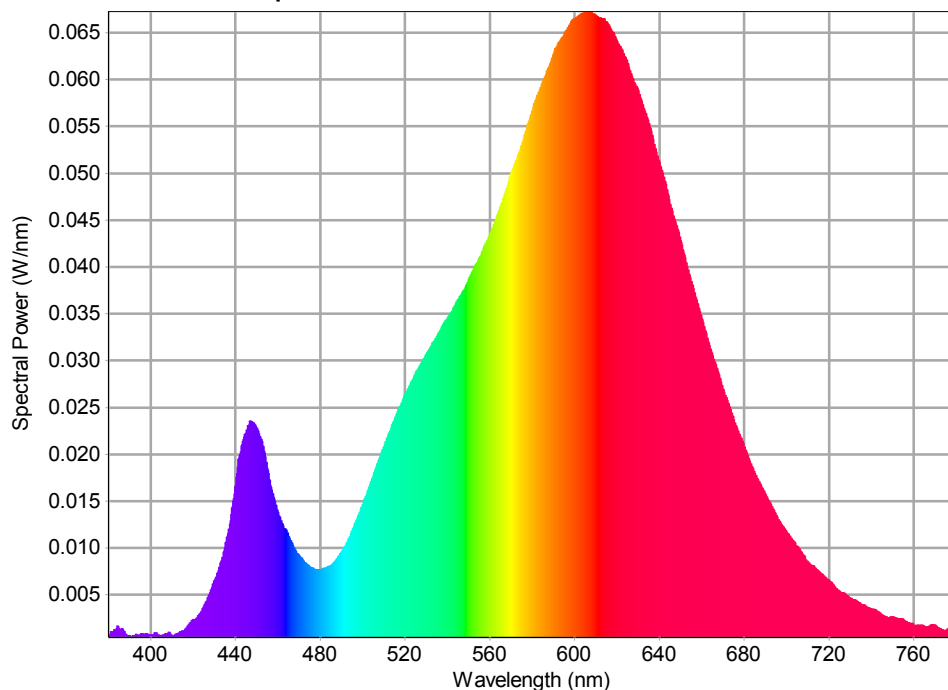
2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca

ISO/IEC 17025



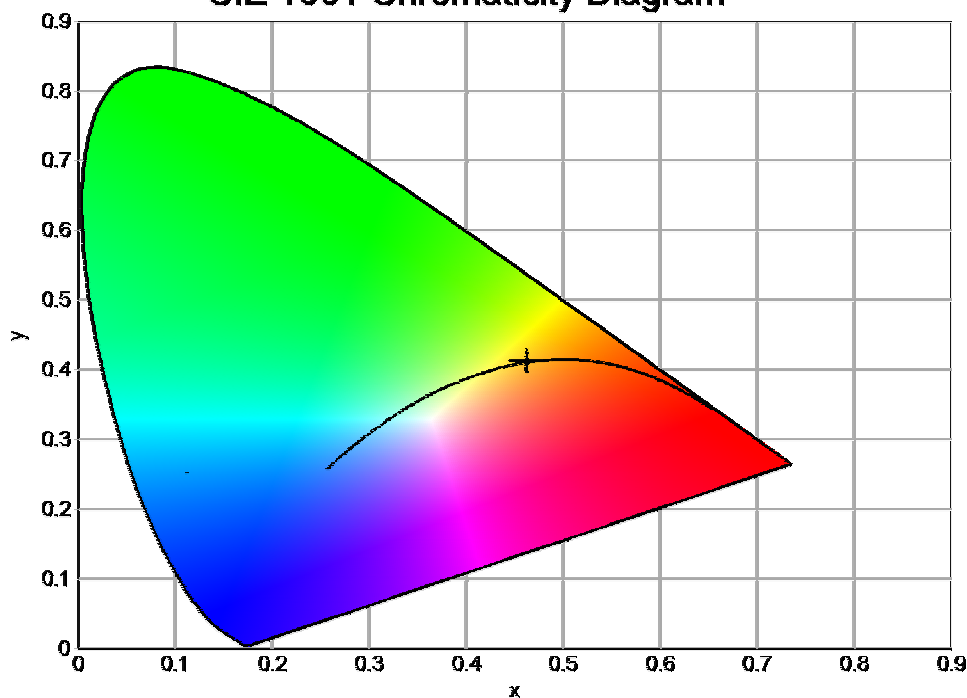
NVLAP LAB CODE: 200899-0

Spectral Power Distribution



Peak Wavelength	606 nm
Luminous Flux	3128 lm
Input Power	60.84 W
Lumens/Watt	51.4
Full Width/Half Maximum	123.65
Center Wavelength	599 nm
Centroid Wavelength	419 nm
Dominant Wavelength	586 nm
Excitation Purity	0.1385
Colorimetric Purity	0.1509

CIE 1931 Chromaticity Diagram



x	0.4616	CCT	2696 K
y	0.4134	CRI	80
u	0.2624	L*	25.67
v	0.3524	a*	0.99
u'	0.2624	b*	3.79
v'	0.5287	Duv	0.0009
R1	78.2	R9	3.9
R2	87.9	R10	71.9
R3	96.3	R11	76.2
R4	78.3	R12	65.8
R5	77.3	R13	80.0
R6	84.5	R14	97.6
R7	82.7		
R8	57.0		



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	0.00062	405	0.00062	430	0.00652	455	0.01856
381	0.00085	406	0.00075	431	0.00694	456	0.01738
382	0.00106	407	0.00089	432	0.00763	457	0.01623
383	0.00134	408	0.00086	433	0.00845	458	0.01546
384	0.00145	409	0.00098	434	0.00905	459	0.01467
385	0.00144	410	0.00065	435	0.01007	460	0.01386
386	0.00130	411	0.00069	436	0.01119	461	0.01326
387	0.00127	412	0.00084	437	0.01203	462	0.01264
388	0.00087	413	0.00091	438	0.01360	463	0.01212
389	0.00067	414	0.00111	439	0.01504	464	0.01190
390	0.00072	415	0.00119	440	0.01659	465	0.01129
391	0.00054	416	0.00119	441	0.01870	466	0.01082
392	0.00059	417	0.00155	442	0.01992	467	0.01033
393	0.00082	418	0.00184	443	0.02096	468	0.00985
394	0.00068	419	0.00208	444	0.02187	469	0.00949
395	0.00078	420	0.00244	445	0.02231	470	0.00924
396	0.00095	421	0.00242	446	0.02310	471	0.00900
397	0.00080	422	0.00265	447	0.02360	472	0.00869
398	0.00091	423	0.00295	448	0.02349	473	0.00843
399	0.00073	424	0.00325	449	0.02325	474	0.00825
400	0.00080	425	0.00382	450	0.02288	475	0.00803
401	0.00078	426	0.00425	451	0.02222	476	0.00794
402	0.00096	427	0.00478	452	0.02171	477	0.00781
403	0.00083	428	0.00526	453	0.02095	478	0.00773
404	0.00076	429	0.00586	454	0.01981	479	0.00774



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	0.00771	505	0.01776	530	0.03072	555	0.04095
481	0.00780	506	0.01843	531	0.03111	556	0.04141
482	0.00789	507	0.01902	532	0.03147	557	0.04194
483	0.00794	508	0.01967	533	0.03192	558	0.04250
484	0.00807	509	0.02026	534	0.03222	559	0.04290
485	0.00817	510	0.02083	535	0.03259	560	0.04347
486	0.00837	511	0.02143	536	0.03301	561	0.04407
487	0.00861	512	0.02204	537	0.03343	562	0.04457
488	0.00891	513	0.02252	538	0.03391	563	0.04520
489	0.00926	514	0.02316	539	0.03429	564	0.04580
490	0.00961	515	0.02375	540	0.03459	565	0.04642
491	0.00997	516	0.02431	541	0.03494	566	0.04700
492	0.01037	517	0.02488	542	0.03524	567	0.04778
493	0.01078	518	0.02531	543	0.03566	568	0.04842
494	0.01126	519	0.02588	544	0.03615	569	0.04922
495	0.01182	520	0.02644	545	0.03656	570	0.04998
496	0.01240	521	0.02683	546	0.03690	571	0.05051
497	0.01296	522	0.02727	547	0.03731	572	0.05118
498	0.01348	523	0.02776	548	0.03760	573	0.05169
499	0.01409	524	0.02823	549	0.03812	574	0.05228
500	0.01464	525	0.02870	550	0.03867	575	0.05299
501	0.01528	526	0.02910	551	0.03915	576	0.05369
502	0.01584	527	0.02946	552	0.03962	577	0.05450
503	0.01651	528	0.02991	553	0.04012	578	0.05530
504	0.01710	529	0.03027	554	0.04048	579	0.05597



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	0.05665	605	0.06728	630	0.05882	655	0.03851
581	0.05747	606	0.06729	631	0.05808	656	0.03775
582	0.05807	607	0.06725	632	0.05744	657	0.03683
583	0.05863	608	0.06719	633	0.05670	658	0.03614
584	0.05916	609	0.06706	634	0.05608	659	0.03531
585	0.05986	610	0.06691	635	0.05537	660	0.03455
586	0.06036	611	0.06671	636	0.05457	661	0.03371
587	0.06095	612	0.06661	637	0.05365	662	0.03297
588	0.06147	613	0.06660	638	0.05269	663	0.03206
589	0.06200	614	0.06652	639	0.05189	664	0.03133
590	0.06270	615	0.06620	640	0.05117	665	0.03058
591	0.06333	616	0.06591	641	0.05039	666	0.02991
592	0.06374	617	0.06541	642	0.04965	667	0.02926
593	0.06413	618	0.06509	643	0.04890	668	0.02849
594	0.06448	619	0.06464	644	0.04785	669	0.02776
595	0.06479	620	0.06413	645	0.04677	670	0.02702
596	0.06524	621	0.06371	646	0.04600	671	0.02635
597	0.06560	622	0.06331	647	0.04517	672	0.02579
598	0.06606	623	0.06282	648	0.04448	673	0.02515
599	0.06642	624	0.06238	649	0.04374	674	0.02447
600	0.06659	625	0.06181	650	0.04286	675	0.02374
601	0.06667	626	0.06101	651	0.04188	676	0.02311
602	0.06688	627	0.06037	652	0.04105	677	0.02255
603	0.06706	628	0.05977	653	0.04009	678	0.02198
604	0.06713	629	0.05935	654	0.03928	679	0.02150



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	0.02085	706	0.00992	732	0.00455	758	0.00201
681	0.02024	707	0.00957	733	0.00441	759	0.00200
682	0.01962	708	0.00928	734	0.00421	760	0.00179
683	0.01904	709	0.00878	735	0.00407	761	0.00173
684	0.01853	710	0.00856	736	0.00393	762	0.00180
685	0.01800	711	0.00828	737	0.00385	763	0.00178
686	0.01753	712	0.00812	738	0.00372	764	0.00183
687	0.01711	713	0.00803	739	0.00367	765	0.00170
688	0.01666	714	0.00775	740	0.00350	766	0.00162
689	0.01624	715	0.00759	741	0.00350	767	0.00169
690	0.01578	716	0.00736	742	0.00345	768	0.00181
691	0.01529	717	0.00718	743	0.00325	769	0.00182
692	0.01491	718	0.00695	744	0.00309	770	0.00183
693	0.01445	719	0.00674	745	0.00291	771	0.00162
694	0.01407	720	0.00658	746	0.00276	772	0.00146
695	0.01359	721	0.00638	747	0.00270	773	0.00125
696	0.01311	722	0.00609	748	0.00263	774	0.00121
697	0.01273	723	0.00576	749	0.00267	775	0.00121
698	0.01240	724	0.00555	750	0.00268	776	0.00136
699	0.01211	725	0.00544	751	0.00261	777	0.00137
700	0.01174	726	0.00526	752	0.00256	778	0.00144
701	0.01150	727	0.00521	753	0.00249	779	0.00137
702	0.01112	728	0.00500	754	0.00248	780	0.00126
703	0.01082	729	0.00491	755	0.00243		
704	0.01053	730	0.00471	756	0.00218		
705	0.01022	731	0.00457	757	0.00209		