



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: CY2383	Driver Details: CY963	
Test Report	L1511263-C1	Description	Clusters of 48 Cree XPE2 LED's	Type Commercial
Test Date	26 November 2015	Manufacturer	Cree	Description 61W
Report Date	8 December 2015	Catalog No.	LOG-HO-120-48-30K-10x60-SI-NO	Manufacturer Mean Well
Sphere Temperature	23.0 °C	Serial No.	SRIS 2216	Catalog No. LPF-60-24
Humidity	21.3 %	Diameter	N/A mm	Voltage 120.00 V
Lamp Type	SSL	Color	White	Power Factor 0.9900

Stabilization Time: 1 heure 15 minutes

Tested By: Marc Viwonou Sena

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.

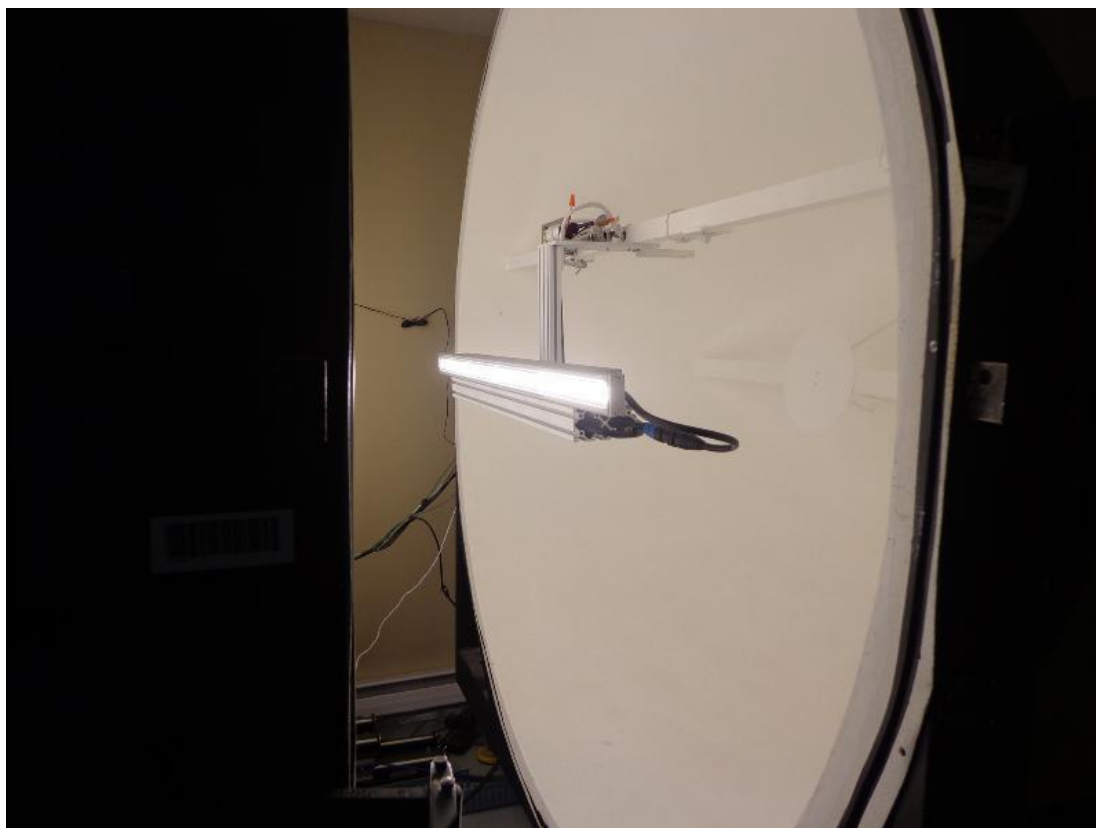


Realization of Sphere Test

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).





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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



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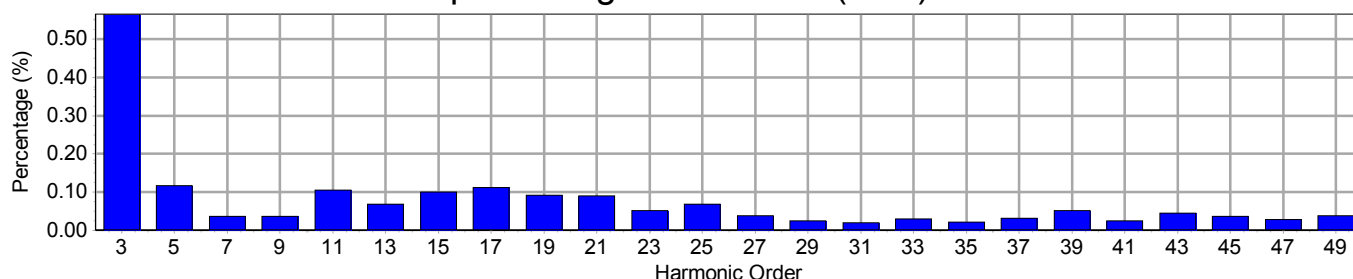
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Electrical Measurements

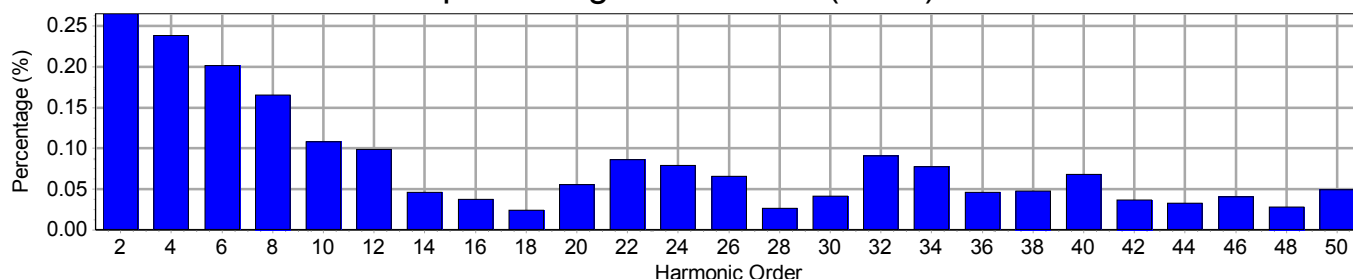
Input

Frequency	60 Hz	Active Power	61.09 W	THDV [ANSI]	0.82 %
Voltage	120.2 V(rms)	Apparent Power	61.56 VA	THDA [ANSI]	5.47 %
Current	0.5121 A(rms)	Power Factor	0.992	Max. Harmonic At	5th order

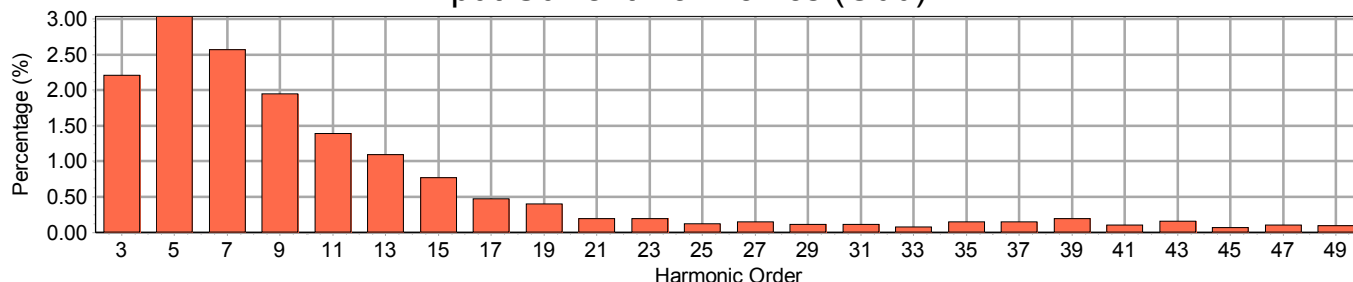
Input Voltage Harmonics (Odd)



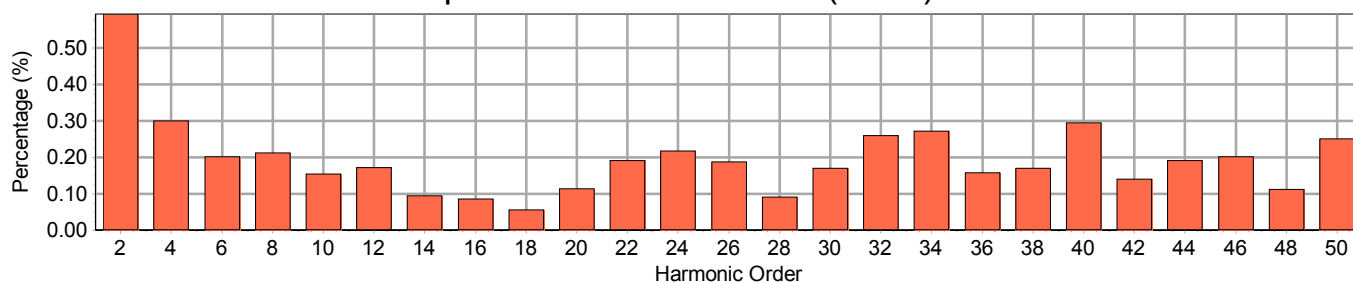
Input Voltage Harmonics (Even)



Input Current Harmonics (Odd)



Input Current Harmonics (Even)





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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	0.266	0.595
3	180	0.567	2.212	4	240	0.239	0.300
5	300	0.117	3.041	6	360	0.202	0.201
7	420	0.035	2.564	8	480	0.165	0.212
9	540	0.036	1.945	10	600	0.108	0.154
11	660	0.106	1.394	12	720	0.099	0.172
13	780	0.069	1.093	14	840	0.046	0.095
15	900	0.099	0.770	16	960	0.037	0.086
17	1020	0.112	0.476	18	1080	0.024	0.055
19	1140	0.091	0.404	20	1200	0.055	0.113
21	1260	0.090	0.197	22	1320	0.086	0.191
23	1380	0.051	0.193	24	1440	0.079	0.218
25	1500	0.068	0.125	26	1560	0.065	0.188
27	1620	0.038	0.148	28	1680	0.026	0.090
29	1740	0.024	0.113	30	1800	0.041	0.170
31	1860	0.019	0.110	32	1920	0.091	0.260
33	1980	0.030	0.077	34	2040	0.078	0.272
35	2100	0.021	0.145	36	2160	0.046	0.158
37	2220	0.030	0.147	38	2280	0.047	0.170
39	2340	0.051	0.194	40	2400	0.068	0.295
41	2460	0.024	0.105	42	2520	0.037	0.140
43	2580	0.044	0.159	44	2640	0.033	0.191
45	2700	0.036	0.071	46	2760	0.041	0.202
47	2820	0.027	0.105	48	2880	0.028	0.111
49	2940	0.037	0.093	50	3000	0.049	0.251



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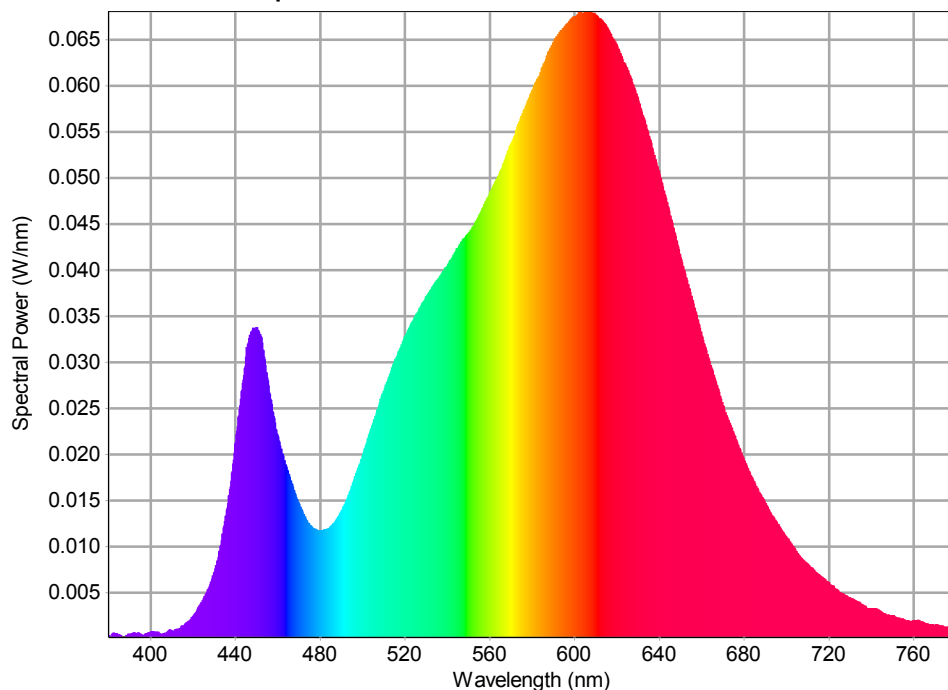
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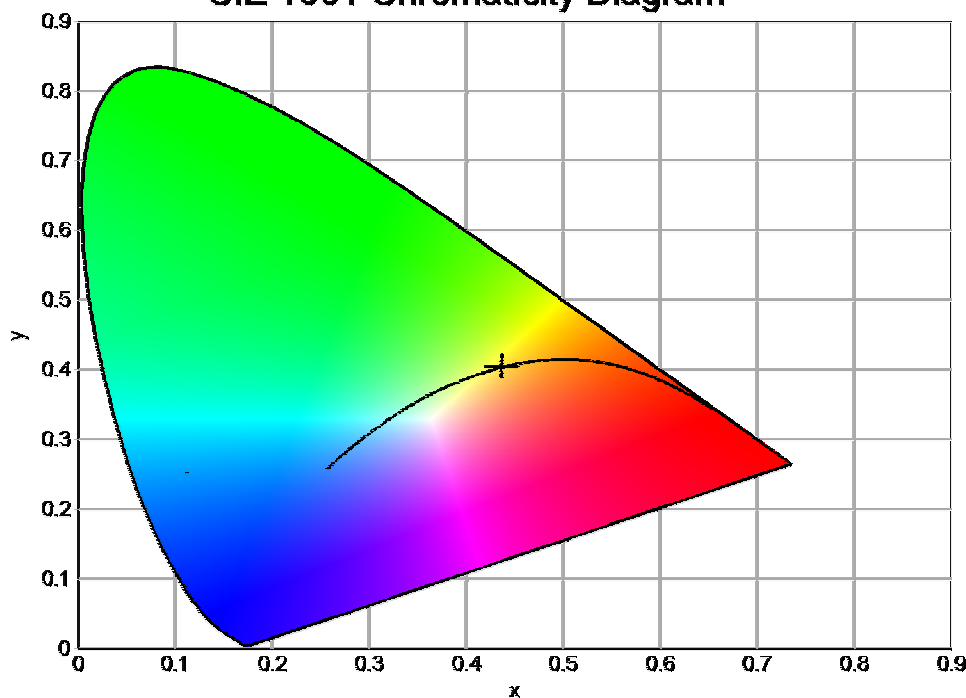
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Spectral Power Distribution



Peak Wavelength	607 nm
Luminous Flux	3414 lm
Input Power	61.09 W
Lumens/Watt	55.9
Full Width/Half Maximum	136.15
Center Wavelength	591 nm
Centroid Wavelength	404 nm
Dominant Wavelength	492 nm
Excitation Purity	0.0284
Colorimetric Purity	0.0236

CIE 1931 Chromaticity Diagram



x	0.4359	CCT	3028 K
y	0.4054	CRI	83
u	0.2493	L*	25.67
v	0.3478	a*	-1.28
u'	0.2493	b*	-2.31
v'	0.5218	Duv	0.0007
R1	81.0	R9	10.7
R2	89.2	R10	74.4
R3	95.9	R11	80.2
R4	81.5	R12	67.4
R5	80.5	R13	82.7
R6	86.1	R14	97.4
R7	84.8		
R8	61.8		



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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	0.00043	405	0.00043	430	0.00720	455	0.02830
381	0.00027	406	0.00062	431	0.00797	456	0.02670
382	0.00054	407	0.00066	432	0.00890	457	0.02548
383	0.00043	408	0.00077	433	0.01004	458	0.02418
384	0.00063	409	0.00100	434	0.01140	459	0.02279
385	0.00046	410	0.00091	435	0.01280	460	0.02196
386	0.00038	411	0.00080	436	0.01402	461	0.02099
387	0.00027	412	0.00100	437	0.01552	462	0.02016
388	0.00025	413	0.00099	438	0.01712	463	0.01938
389	0.00042	414	0.00117	439	0.01901	464	0.01866
390	0.00038	415	0.00147	440	0.02116	465	0.01793
391	0.00063	416	0.00155	441	0.02306	466	0.01721
392	0.00068	417	0.00176	442	0.02492	467	0.01654
393	0.00061	418	0.00192	443	0.02684	468	0.01581
394	0.00068	419	0.00212	444	0.02863	469	0.01517
395	0.00056	420	0.00247	445	0.03060	470	0.01462
396	0.00040	421	0.00278	446	0.03198	471	0.01407
397	0.00043	422	0.00318	447	0.03298	472	0.01355
398	0.00059	423	0.00363	448	0.03345	473	0.01306
399	0.00066	424	0.00395	449	0.03356	474	0.01265
400	0.00078	425	0.00442	450	0.03383	475	0.01237
401	0.00083	426	0.00487	451	0.03335	476	0.01216
402	0.00076	427	0.00533	452	0.03285	477	0.01195
403	0.00075	428	0.00588	453	0.03141	478	0.01185
404	0.00063	429	0.00651	454	0.02973	479	0.01172



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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	0.01175	505	0.02344	530	0.03713	555	0.04598
481	0.01177	506	0.02413	531	0.03749	556	0.04645
482	0.01183	507	0.02482	532	0.03786	557	0.04689
483	0.01189	508	0.02561	533	0.03821	558	0.04743
484	0.01199	509	0.02628	534	0.03858	559	0.04781
485	0.01219	510	0.02684	535	0.03887	560	0.04839
486	0.01246	511	0.02755	536	0.03915	561	0.04881
487	0.01272	512	0.02810	537	0.03952	562	0.04930
488	0.01307	513	0.02874	538	0.03989	563	0.04978
489	0.01346	514	0.02946	539	0.04024	564	0.05017
490	0.01389	515	0.03008	540	0.04051	565	0.05073
491	0.01435	516	0.03056	541	0.04096	566	0.05122
492	0.01482	517	0.03115	542	0.04127	567	0.05190
493	0.01534	518	0.03166	543	0.04168	568	0.05249
494	0.01594	519	0.03226	544	0.04208	569	0.05318
495	0.01658	520	0.03283	545	0.04242	570	0.05373
496	0.01728	521	0.03325	546	0.04284	571	0.05417
497	0.01796	522	0.03376	547	0.04320	572	0.05476
498	0.01856	523	0.03423	548	0.04345	573	0.05553
499	0.01918	524	0.03467	549	0.04377	574	0.05610
500	0.01988	525	0.03506	550	0.04399	575	0.05670
501	0.02062	526	0.03542	551	0.04435	576	0.05738
502	0.02131	527	0.03586	552	0.04468	577	0.05779
503	0.02215	528	0.03635	553	0.04514	578	0.05836
504	0.02277	529	0.03665	554	0.04551	579	0.05899



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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	0.05948	605	0.06807	630	0.05841	655	0.03723
581	0.06004	606	0.06802	631	0.05766	656	0.03641
582	0.06056	607	0.06801	632	0.05687	657	0.03554
583	0.06099	608	0.06794	633	0.05626	658	0.03467
584	0.06145	609	0.06789	634	0.05533	659	0.03376
585	0.06215	610	0.06771	635	0.05461	660	0.03293
586	0.06263	611	0.06741	636	0.05379	661	0.03206
587	0.06328	612	0.06728	637	0.05287	662	0.03132
588	0.06383	613	0.06707	638	0.05207	663	0.03053
589	0.06423	614	0.06682	639	0.05129	664	0.02974
590	0.06472	615	0.06643	640	0.05050	665	0.02909
591	0.06512	616	0.06609	641	0.04956	666	0.02831
592	0.06543	617	0.06558	642	0.04865	667	0.02756
593	0.06584	618	0.06512	643	0.04787	668	0.02679
594	0.06605	619	0.06480	644	0.04693	669	0.02600
595	0.06632	620	0.06432	645	0.04596	670	0.02534
596	0.06663	621	0.06382	646	0.04511	671	0.02459
597	0.06683	622	0.06326	647	0.04417	672	0.02399
598	0.06720	623	0.06260	648	0.04328	673	0.02345
599	0.06744	624	0.06225	649	0.04228	674	0.02290
600	0.06757	625	0.06173	650	0.04135	675	0.02231
601	0.06761	626	0.06115	651	0.04045	676	0.02168
602	0.06795	627	0.06044	652	0.03968	677	0.02109
603	0.06795	628	0.05984	653	0.03890	678	0.02052
604	0.06786	629	0.05918	654	0.03807	679	0.01989



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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	0.01936	706	0.00903	732	0.00422	758	0.00186
681	0.01881	707	0.00875	733	0.00406	759	0.00190
682	0.01826	708	0.00852	734	0.00403	760	0.00201
683	0.01777	709	0.00830	735	0.00383	761	0.00196
684	0.01730	710	0.00814	736	0.00370	762	0.00204
685	0.01686	711	0.00783	737	0.00358	763	0.00188
686	0.01640	712	0.00771	738	0.00334	764	0.00184
687	0.01591	713	0.00739	739	0.00334	765	0.00174
688	0.01551	714	0.00719	740	0.00333	766	0.00165
689	0.01516	715	0.00702	741	0.00332	767	0.00156
690	0.01472	716	0.00678	742	0.00334	768	0.00156
691	0.01427	717	0.00666	743	0.00316	769	0.00155
692	0.01384	718	0.00647	744	0.00303	770	0.00146
693	0.01338	719	0.00627	745	0.00288	771	0.00152
694	0.01313	720	0.00607	746	0.00275	772	0.00143
695	0.01276	721	0.00585	747	0.00257	773	0.00147
696	0.01240	722	0.00575	748	0.00259	774	0.00131
697	0.01200	723	0.00543	749	0.00258	775	0.00119
698	0.01168	724	0.00535	750	0.00257	776	0.00130
699	0.01134	725	0.00507	751	0.00240	777	0.00126
700	0.01099	726	0.00494	752	0.00230	778	0.00132
701	0.01075	727	0.00482	753	0.00227	779	0.00134
702	0.01037	728	0.00473	754	0.00208	780	0.00140
703	0.01008	729	0.00452	755	0.00216		
704	0.00971	730	0.00444	756	0.00200		
705	0.00932	731	0.00438	757	0.00199		