



LUMINAIRE TESTING LABORATORY, INC.

SUSTAINING
MEMBER
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IESNA

905 Harrison Street · Allentown, PA 18103 · 610-770-1044 · Fax 610-770-8912 · www.LuminaireTesting.com

LTL NUMBER: 20117 DATE: 08-23-2010
PREPARED FOR: SPECTRUM LIGHTING
CATALOG NUMBER: SX1003RDLED18W/SM (TYPE F)
LUMINAIRE: FORMED WHITE ENAMEL ALUMINUM HOUSING, FORMED WHITE ENAMEL ALUMINUM REFLECTOR, MOLDED TRANSLUCENT WHITE PLASTIC ENCLOSURE.
LAMP: 24 WHITE LEDS

MOUNTING: SURFACE
ELECTRICAL VALUES: 120.0VAC, 0.1931A, 22.84W, PF=0.986
NOTE: THIS TEST WAS PERFORMED USING THE CALIBRATED PHOTODETECTOR METHOD OF ABSOLUTE PHOTOMETRY.*

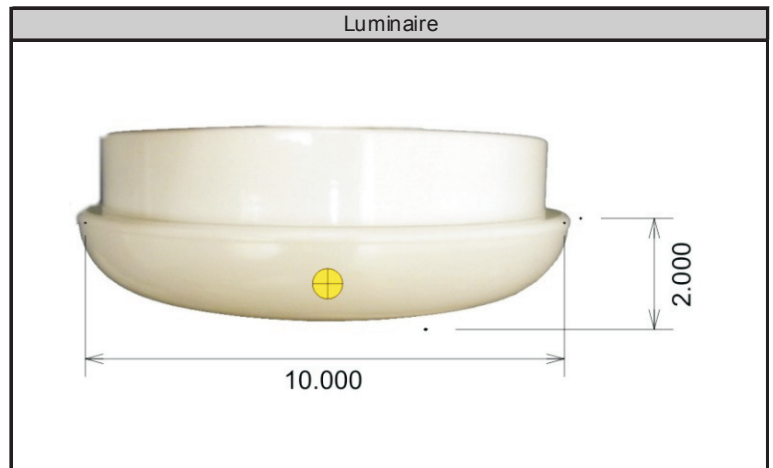
Candela Distribution

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	Flux
0	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296	
5	295	295	295	295	295	295	295	295	295	295	295	295	295	295	295	295	28.0
15	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	80.5
25	267	267	267	267	267	267	267	267	267	267	267	267	267	267	267	267	122.9
35	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	150.0
45	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	158.8
55	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	148.3
65	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	120.3
75	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	80.7
85	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	43.9
90	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
95	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	24.3
105	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	18.0
115	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14.9
125	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	12.3
135	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	9.8
145	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	7.6
155	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	5.6
165	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	3.6
175	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	1.1
180	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	

Zonal Lumen Summary

Zone	Lumens	% of Lamp	% of Luminaire
0-30	231.5	N/A	22.5%
0-40	381.6	N/A	37.0%
0-60	688.6	N/A	66.8%
0-90	933.5	N/A	90.6%
90-180	97.3	N/A	9.4%
0-180	1030.8	N/A	100.0%

Total lumen Output: 1030.8 Lumens
Luminaire efficacy: 45.1 Lumens per Watt
CIE Type: Direct
Spacing Criterion: 1.28



Approved By: MG

*DATA WAS ACQUIRED USING THE CALIBRATED PHOTODETECTOR METHOD OF ABSOLUTE PHOTOMETRY. A UDT MODEL #211 PHOTODETECTOR AND UDT MODEL #S370 OPTOMETER COMBINATION WERE USED AS A STANDARD. A SPECTRAL MISMATCH CORRECTION FACTOR WAS EMPLOYED BASED ON THE SPECTRAL RESPONSIVITY OF THE PHOTODETECTOR AND THE SPECTRAL POWER DISTRIBUTION OF THE TEST SUBJECT.

TESTING WAS PERFORMED IN ACCORDANCE WITH IES LM-79-08.
TEST ANGULAR INCREMENTS AND REPORT FORMATTING WAS BASED ON IES LM-41-98 AND LM-46-04.



Candela Tabulation (5 degree Vertical Increments)

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296
5	295	295	295	295	295	295	295	295	295	295	295	295	295	295	295	295
10	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
15	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285
20	277	277	277	277	277	277	277	277	277	277	277	277	277	277	277	277
25	267	267	267	267	267	267	267	267	267	267	267	267	267	267	267	267
30	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254
35	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240
40	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224
45	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206
50	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187
55	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166
60	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144
65	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
70	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
75	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
80	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
85	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
90	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
95	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
100	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
105	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
110	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
115	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
120	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
125	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
130	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
135	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
140	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
145	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
150	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
155	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
160	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
165	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
170	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
175	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
180	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11

Zonal Lumen Tabulation (5 degree zones)

Zone	Lumens	Zone	Lumens	Zone	Lumens	Zone	Lumens
0-5	7.1	45-50	79.3	90-95	13.5	135-140	4.6
5-10	21.0	50-55	76.6	95-100	10.8	140-145	4.1
10-15	34.2	55-60	71.7	100-105	9.4	145-150	3.5
15-20	46.3	60-65	64.6	105-110	8.6	150-155	3.0
20-25	57.0	65-70	55.7	110-115	7.8	155-160	2.6
25-30	65.9	70-75	45.6	115-120	7.1	160-165	2.1
30-35	72.7	75-80	35.2	120-125	6.4	165-170	1.5
35-40	77.3	80-85	25.7	125-130	5.8	170-175	0.9
40-45	79.5	85-90	18.3	130-135	5.2	175-180	0.3



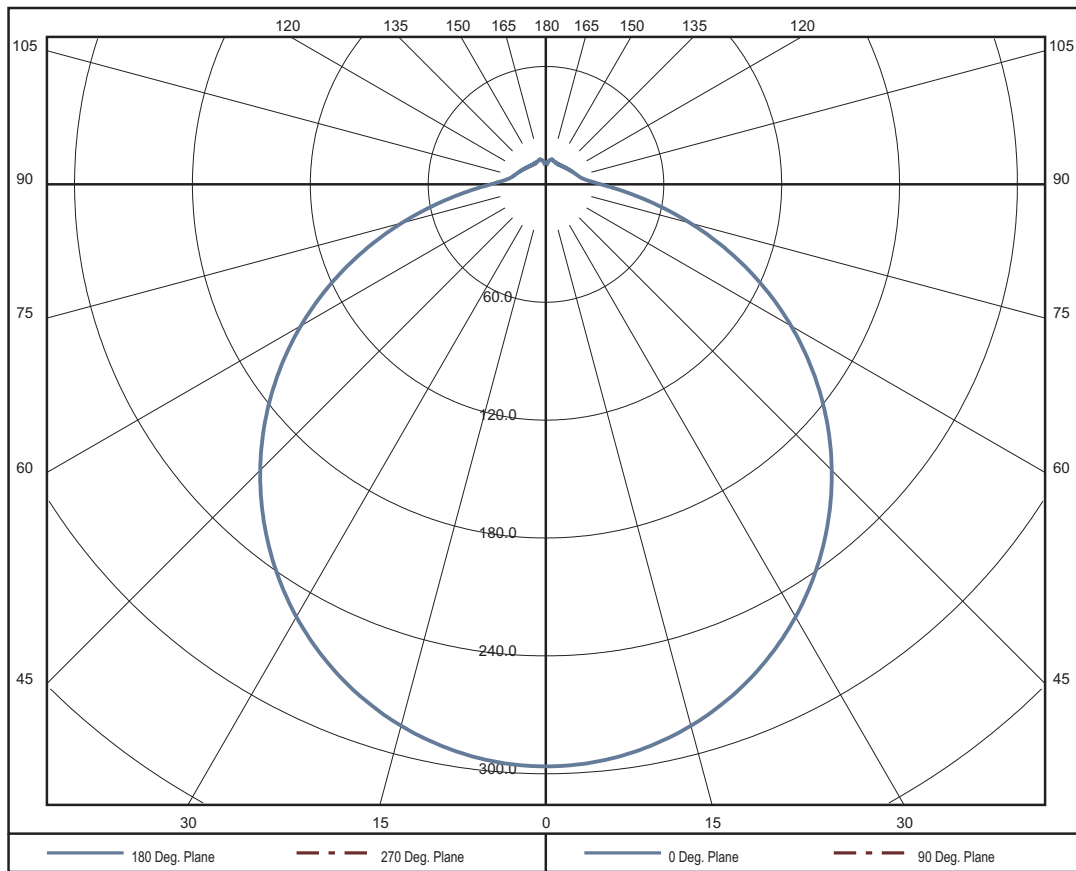
Utilization of Lumens - Zonal Cavity Method												
Effective Floor Cavity Reflectance 20%												
Ceiling Cavity Reflectance	90				80				70			
Wall Reflectance	70	50	30	10	70	50	30	10	70	50	30	10
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **											
0	1245	1245	1245	1245	1204	1204	1204	1204	1165	1165	1165	1165
1	1126	1065	1012	963.2	1085	1031	981.9	937.8	1047	997.6	953.4	913.3
2	1021	920.4	838.4	770.1	981.7	891.1	816.2	753.1	944.8	863	794.6	736.5
3	928.3	803.1	707.6	632.4	891.8	778.2	690.3	620.2	857.3	754.3	673.4	608.2
4	848.1	707.8	606.8	530.7	814.4	686.6	593	521.6	782.6	666.2	579.6	512.5
5	778.3	629.6	527.6	453.3	747.4	611.4	516.4	446.2	718.4	593.9	505.4	439.2
6	717.1	564.6	464.2	393.1	689.1	548.9	454.9	387.4	662.7	533.9	445.8	381.8
7	663.5	510	412.5	345.1	638	496.5	404.7	340.4	614	483.4	397.1	335.8
8	616.3	463.8	369.9	306.2	593.2	452	363.3	302.3	571.4	440.6	356.8	298.4
9	574.6	424.4	334.3	274.2	553.6	414.1	328.6	270.9	533.8	404.1	323	267.6
10	537.6	390.4	304.1	247.4	518.5	381.3	299.2	244.6	500.5	372.5	294.4	241.8

Ceiling Cavity Reflectance	50				30			10			0
Wall Reflectance	70	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **										
0	1091	1091	1091	1091	1024	1024	1024	962.5	962.5	962.5	933.5
1	974.9	935.5	899.5	866.5	878.4	849.5	822.7	825.8	802.9	781.4	752.6
2	876.6	810.2	753.5	704.5	761.6	714.9	674	716.6	678.6	644.8	616.5
3	793.8	709.3	641.1	585	667.6	610.5	562.5	629	581.5	540.9	513.5
4	724.2	627.7	553.6	494.9	592	528.9	477.8	558.7	505.3	461.1	434.9
5	665.1	560.9	484.2	425.4	530.1	463.9	411.9	501.3	444.4	398.8	373.8
6	614.1	505.3	428.2	370.7	478.6	411.2	359.8	453.6	394.9	349.1	325.4
7	569.9	458.5	382.2	326.7	435.3	367.9	317.7	413.4	354.1	308.8	286.5
8	531.3	418.9	344.1	290.8	398.5	331.9	283.3	379.3	320.1	275.8	254.7
9	497.3	384.9	312.1	261.1	366.9	301.6	254.7	349.9	291.4	248.4	228.4
10	467.2	355.6	285	236.2	339.7	275.8	230.7	324.6	266.9	225.3	206.4

Average Luminance Table (cd/m²)

	0	45	90
0	5847	5847	5847
45	4513	4513	4513
55	4109	4109	4109
65	3584	3584	3584
75	2877	2877	2877
85	2173	2173	2173

THIS TEST WAS CONDUCTED USING PHOTOMETRY TECHNIQUES ACCORDING TO STANDARD IES PROCEDURES. THE USER MUST THEREFORE USE CAUTION IN THE FOLLOWING SITUATIONS: 1) THIS TEST WAS PERFORMED USING A SPECIFIC BALLAST/LAMP COMBINATION. EXTRAPOLATION OF THESE DATA FOR OTHER BALLAST/LAMP COMBINATIONS MAY PRODUCE ERRONEOUS RESULTS. 2) THIS TEST WAS CONDUCTED IN A CONTROLLED LABORATORY ENVIRONMENT WHERE THE AMBIENT TEMPERATURE WAS HELD AT 25°C ±1°C. FIELD PERFORMANCE MAY DIFFER PARTICULARLY IN REGARDS TO CHANGE IN LUMINOUS OUTPUT AS A RESULT OF DIFFERENCE IN AMBIENT TEMPERATURE AND METHOD OF MOUNTING THE LUMINAIRE.





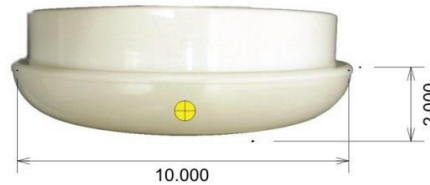
Luminaire Flux and Color Quality Test Report

Test Date: August 17, 2010
LTL Test Number: 20118
Prepared For: Spectrum Lighting
Catalog Number: SX1003RDLED18W/SM (Type F)
Luminaire: Formed white enamel aluminum housing, formed white enamel aluminum reflector, molded translucent white plastic enclosure

Lamp: 24 white LEDs

Measured Luminaire Electrical Values:

Voltage: 119.9 V
Current: 0.190 A
Watts: 22.71 W
Power Factor: 0.995
Temperature: 25.1 °C



Measured Luminaire Photometric Values:

Radiant Flux: 3366 mW
Luminous Flux: 1025 Lumens
Luminaire Efficacy: 45.1 Lumens per Watt
CCT: 3293 K
CRI (Ra): 82.8
Chromaticity (x): 0.4202
Chromaticity (y): 0.4032
Chromaticity (u'): 0.2402
Chromaticity (v'): 0.5185
Duv: 0.0023

Approved by: 

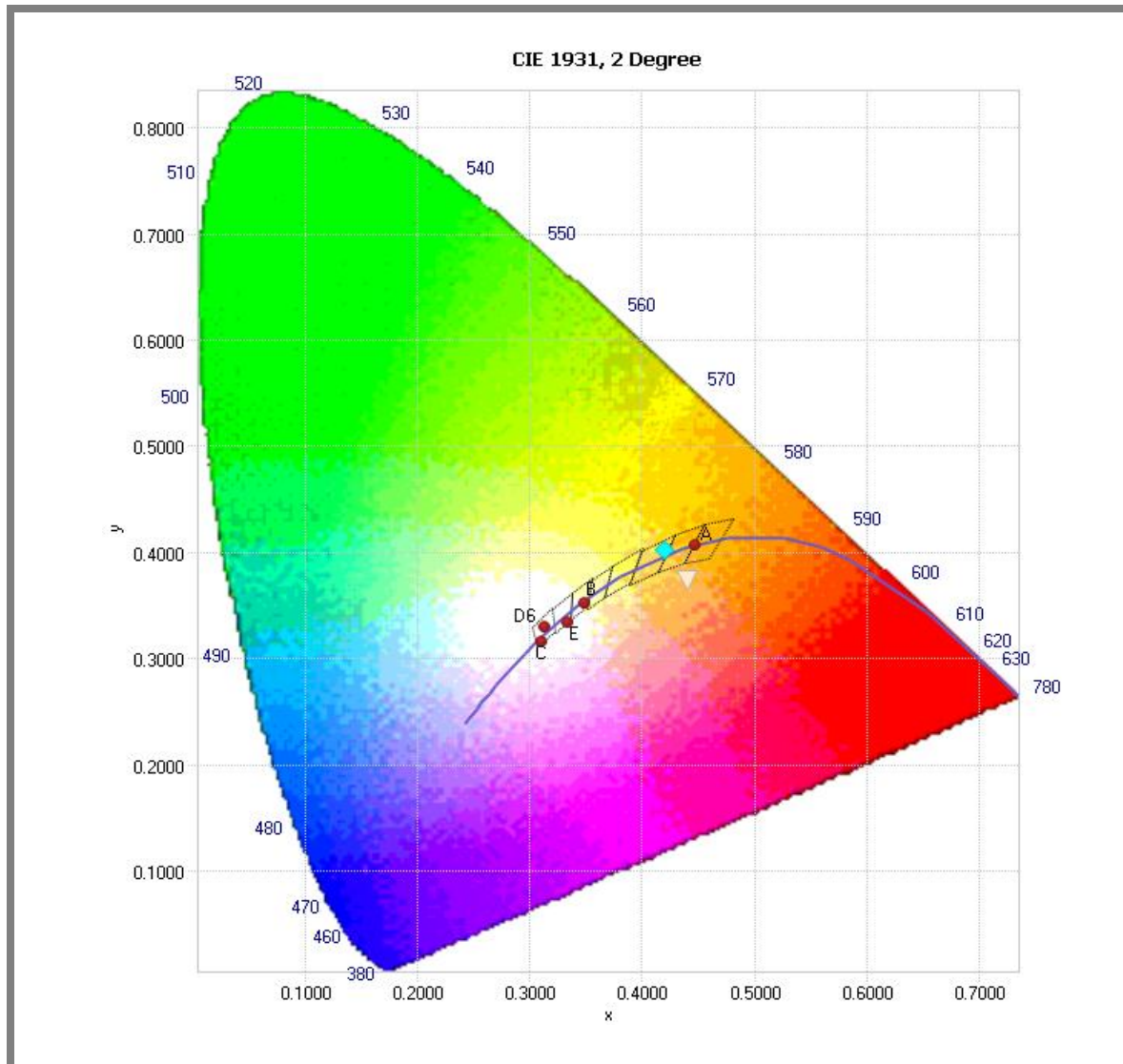
Testing was performed in accordance with IES LM-79-2008



Test Date: August 17, 2010

LTL Test Number: 20118

Chromaticity Coordinates						
x	y	u	v	u'	v'	Duv
0.4202	0.4032	0.2402	0.3457	0.2402	0.5185	0.0023

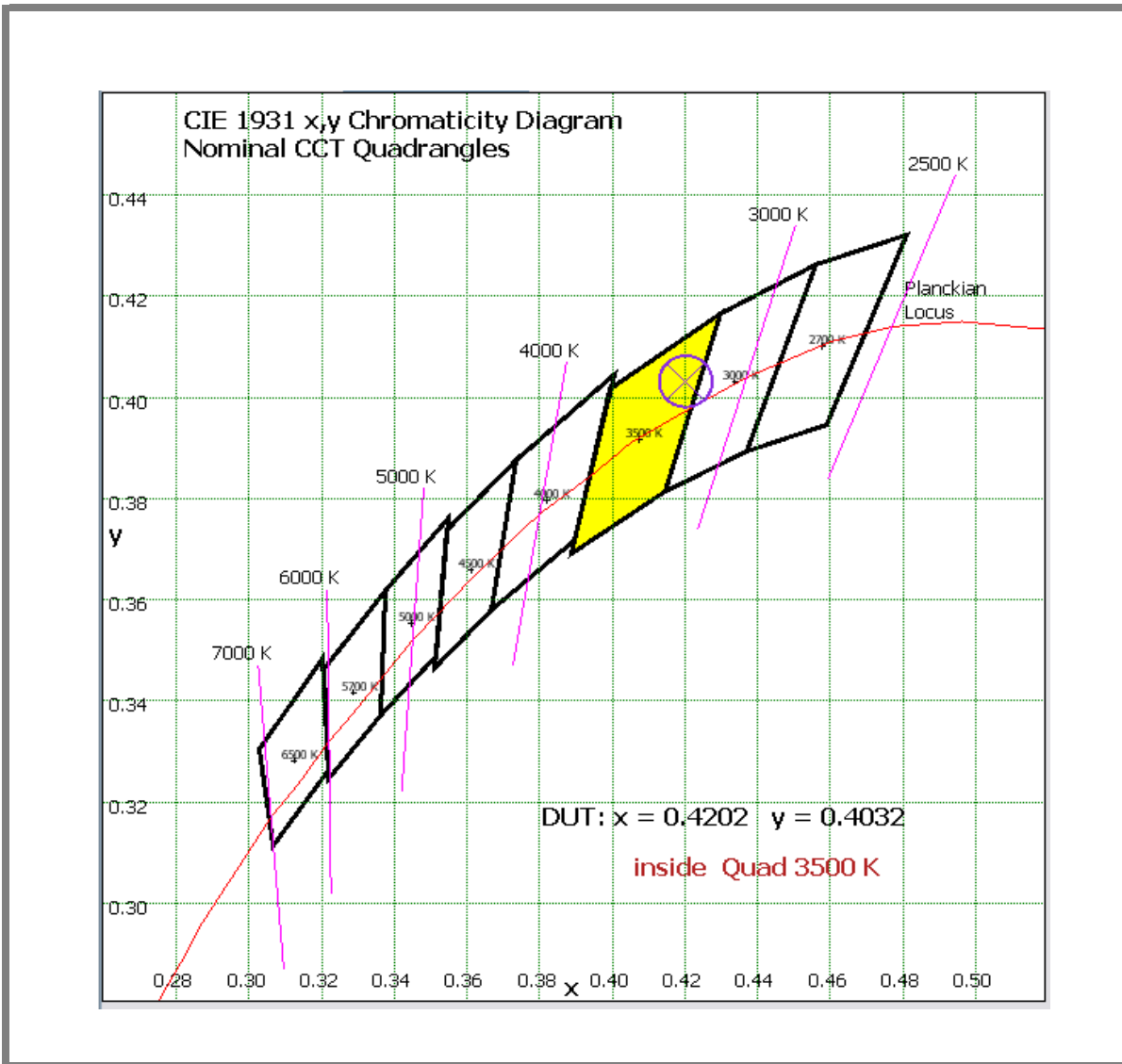




Test Date: August 17, 2010

LTL Test Number: 20118

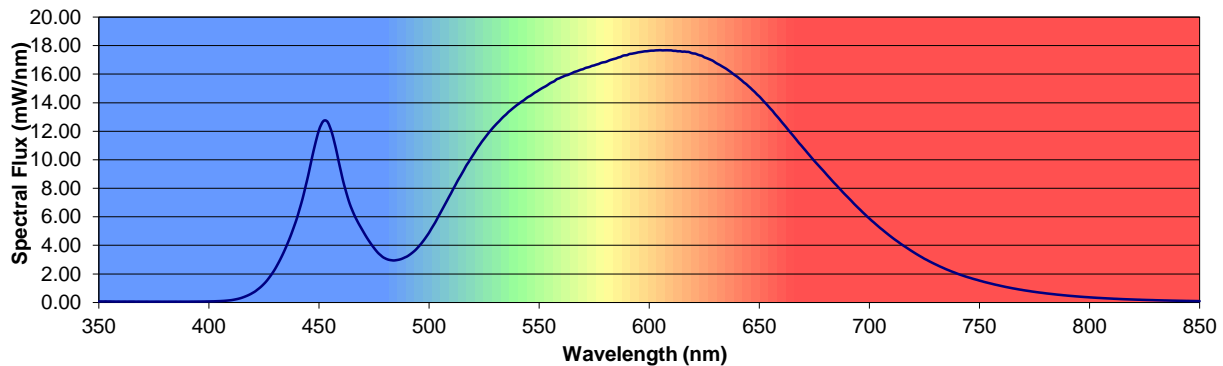
Chromaticity Coordinates						
x	y	u	v	u'	v'	Duv
0.4202	0.4032	0.2402	0.3457	0.2402	0.5185	0.0023





Test Date: August 17, 2010
LTL Test Number: 20118

Spectral Power Distribution table with columns for wavelength (nm) and power (mW) across five groups of data.





Test Date: August 17, 2010

LTL Test Number: 20118

Spectral Power Distribution									
λ (nm)	mW	λ (nm)	mW	λ (nm)	mW	λ (nm)	mW	λ (nm)	mW
600	17.63	650	14.44	700	5.88	750	1.53	800	0.36
601	17.65	651	14.27	701	5.74	751	1.49	801	0.34
602	17.65	652	14.10	702	5.61	752	1.44	802	0.34
603	17.67	653	13.94	703	5.47	753	1.40	803	0.33
604	17.67	654	13.77	704	5.34	754	1.37	804	0.32
605	17.68	655	13.59	705	5.21	755	1.33	805	0.31
606	17.67	656	13.43	706	5.09	756	1.29	806	0.30
607	17.67	657	13.23	707	4.96	757	1.25	807	0.29
608	17.67	658	13.05	708	4.83	758	1.22	808	0.28
609	17.67	659	12.88	709	4.71	759	1.18	809	0.28
610	17.67	660	12.68	710	4.59	760	1.15	810	0.27
611	17.63	661	12.50	711	4.47	761	1.12	811	0.26
612	17.63	662	12.32	712	4.36	762	1.08	812	0.25
613	17.60	663	12.13	713	4.25	763	1.05	813	0.25
614	17.61	664	11.93	714	4.14	764	1.02	814	0.24
615	17.57	665	11.76	715	4.03	765	0.99	815	0.23
616	17.58	666	11.57	716	3.93	766	0.96	816	0.23
617	17.56	667	11.38	717	3.83	767	0.94	817	0.22
618	17.56	668	11.18	718	3.73	768	0.91	818	0.21
619	17.49	669	11.01	719	3.62	769	0.88	819	0.21
620	17.45	670	10.83	720	3.53	770	0.86	820	0.20
621	17.44	671	10.65	721	3.43	771	0.83	821	0.20
622	17.37	672	10.46	722	3.33	772	0.81	822	0.19
623	17.32	673	10.28	723	3.24	773	0.79	823	0.19
624	17.28	674	10.10	724	3.16	774	0.76	824	0.18
625	17.18	675	9.92	725	3.06	775	0.74	825	0.18
626	17.13	676	9.75	726	2.99	776	0.72	826	0.17
627	17.07	677	9.58	727	2.90	777	0.70	827	0.17
628	17.00	678	9.41	728	2.82	778	0.68	828	0.16
629	16.93	679	9.25	729	2.75	779	0.66	829	0.16
630	16.82	680	9.07	730	2.67	780	0.64	830	0.15
632	16.65	682	8.72	732	2.52	782	0.60	832	0.15
633	16.55	683	8.55	733	2.46	783	0.59	833	0.14
634	16.47	684	8.38	734	2.39	784	0.57	834	0.14
635	16.38	685	8.22	735	2.32	785	0.55	835	0.13
636	16.26	686	8.05	736	2.26	786	0.54	836	0.13
637	16.16	687	7.89	737	2.19	787	0.52	837	0.13
638	16.03	688	7.72	738	2.13	788	0.50	838	0.12
639	15.92	689	7.56	739	2.08	789	0.49	839	0.12
640	15.82	690	7.41	740	2.01	790	0.48	840	0.12
641	15.69	691	7.25	741	1.96	791	0.46	841	0.11
642	15.57	692	7.09	742	1.90	792	0.45	842	0.11
643	15.42	693	6.92	743	1.85	793	0.44	843	0.11
644	15.31	694	6.77	744	1.80	794	0.42	844	0.11
645	15.17	695	6.62	745	1.75	795	0.41	845	0.10
646	15.03	696	6.47	746	1.71	796	0.40	846	0.10
647	14.88	697	6.31	747	1.66	797	0.39	847	0.10
648	14.75	698	6.17	748	1.62	798	0.38	848	0.10
649	14.58	699	6.02	749	1.58	799	0.37	849	0.09
								850	0.09



Test Date: August 17, 2010

LTL Test Number: 20118

Color Rendering Index Detail								
R1	R2	R3	R4	R5	R6	R7	R8	Ra (CRI)
82.0	86.0	87.7	82.9	79.8	78.9	90.7	74.7	82.8

Color Rendering Index Detail (Expanded)								
R9	R10	R11	R12	R13	R14			
34.0	65.1	79.0	52.9	82.2	92.3			

Testing was performed in the LTL two-meter integrating sphere (Labsphere model SLMS7650) using a Labsphere model CDS1100 spectrometer and LightMtrX software.

Testing was performed using the 4π geometry method of measurement.

Absorption correction was employed for this measurement.

Electrical power was supplied to the device under test using a regulated power supply.

The device under test was allowed to reach stability according to appropriate IES standards prior to measurement.