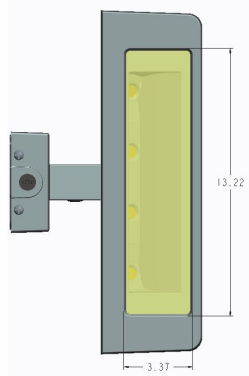


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

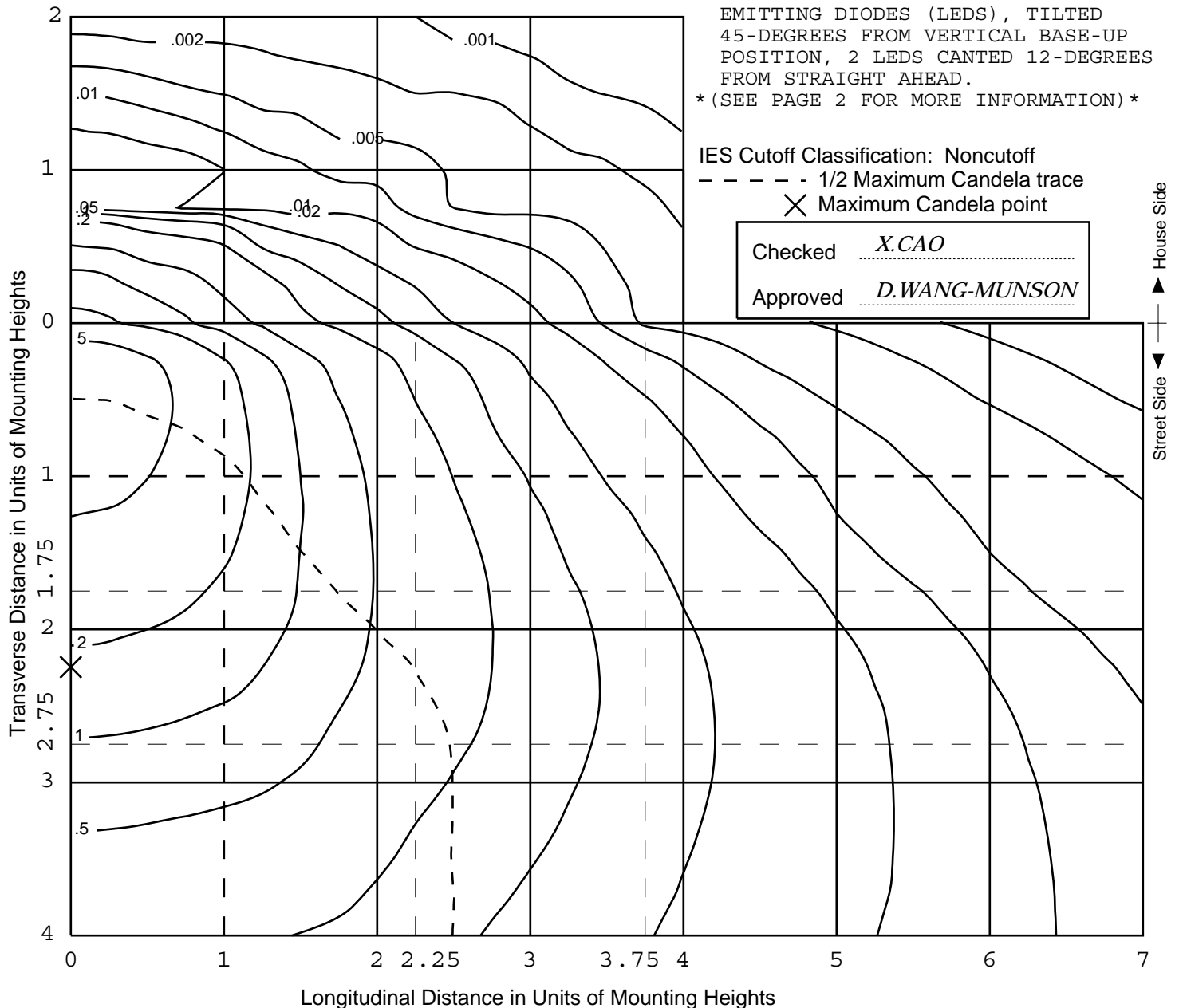
Values based on 20 foot mounting height.



REPORT NUMBER: RAB01937
 ISSUE DATE: 05/10/16 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WPLED104Y / ALED104Y
 (15-DEGREE UPTILT)
 LUMINAIRE: CAST FINNED METAL HOUSING,
 2-PIECE EXTRUDED METAL HEAT SINK, 4
 CIRCUIT BOARDS EACH WITH 1 LED,
 MOLDED PLASTIC REFLECTOR WITH
 SPECULAR FINISH AND 1 OPTICAL
 COMPARTMENT WITH 1 APERTURE PER LED,
 CLEAR FLAT GLASS LENS IN CAST BROWN
 PAINTED METAL FRAME.
 LAMPS: FOUR WHITE MULTI-CHIP LIGHT
 EMITTING DIODES (LEDs), TILTED
 45-DEGREES FROM VERTICAL BASE-UP
 POSITION, 2 LEDS CANTED 12-DEGREES
 FROM STRAIGHT AHEAD.
 (SEE PAGE 2 FOR MORE INFORMATION)

IES Cutoff Classification: Noncutoff

--- 1/2 Maximum Candela trace
 X Maximum Candela point



REPORT NUMBER: RAB01937
ISSUE DATE: 05/10/16
PREPARED FOR: RAB LIGHTING INC.

PAGE: 2 OF 9
DATE SAMPLE TESTED: 05/10/16

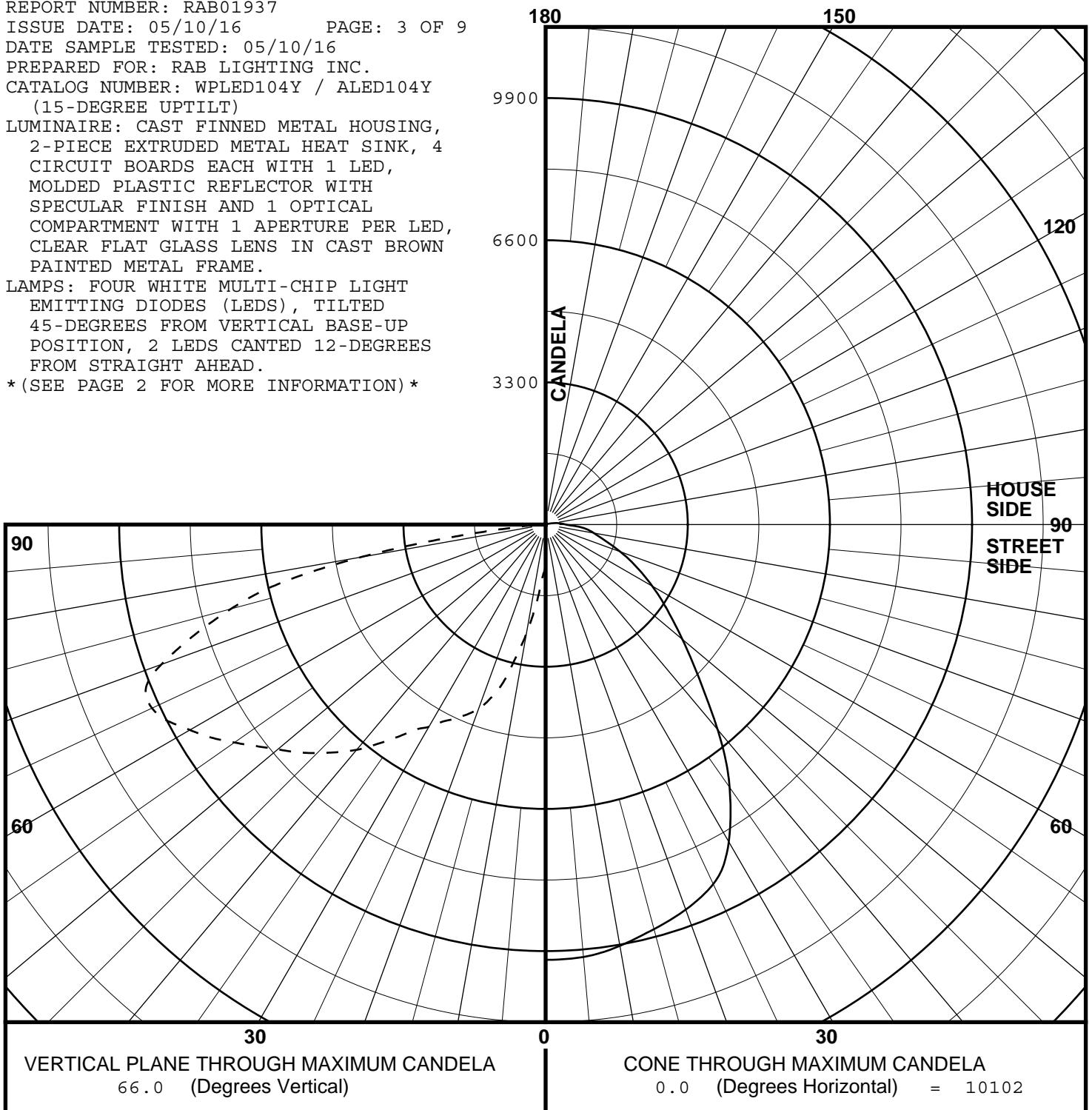
ADDITIONAL INFORMATION

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
TOTAL INPUT WATTS = 108.37 W AT 120.0 VAC.
LED DRIVER: RD-120-A0700
TEST PROCEDURE: IESNA LM-79-08
ACCREDITED LABORATORY CODE 201058-0
TEST DISTANCE : 28.25 FEET

NOTE: THIS REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY
THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR
ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL
GOVERNMENT.

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

REPORT NUMBER: RAB01937
 ISSUE DATE: 05/10/16 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WPLED104Y / ALED104Y
 (15-DEGREE UPTILT)
 LUMINAIRE: CAST FINNED METAL HOUSING,
 2-PIECE EXTRUDED METAL HEAT SINK, 4
 CIRCUIT BOARDS EACH WITH 1 LED,
 MOLDED PLASTIC REFLECTOR WITH
 SPECULAR FINISH AND 1 OPTICAL
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 CLEAR FLAT GLASS LENS IN CAST BROWN
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 LAMPS: FOUR WHITE MULTI-CHIP LIGHT
 EMITTING DIODES (LEDs), TILTED
 45-DEGREES FROM VERTICAL BASE-UP
 POSITION, 2 LEDS CANTED 12-DEGREES
 FROM STRAIGHT AHEAD.
 *(SEE PAGE 2 FOR MORE INFORMATION) *



REPORT NUMBER: RAB01937

STREET SIDE

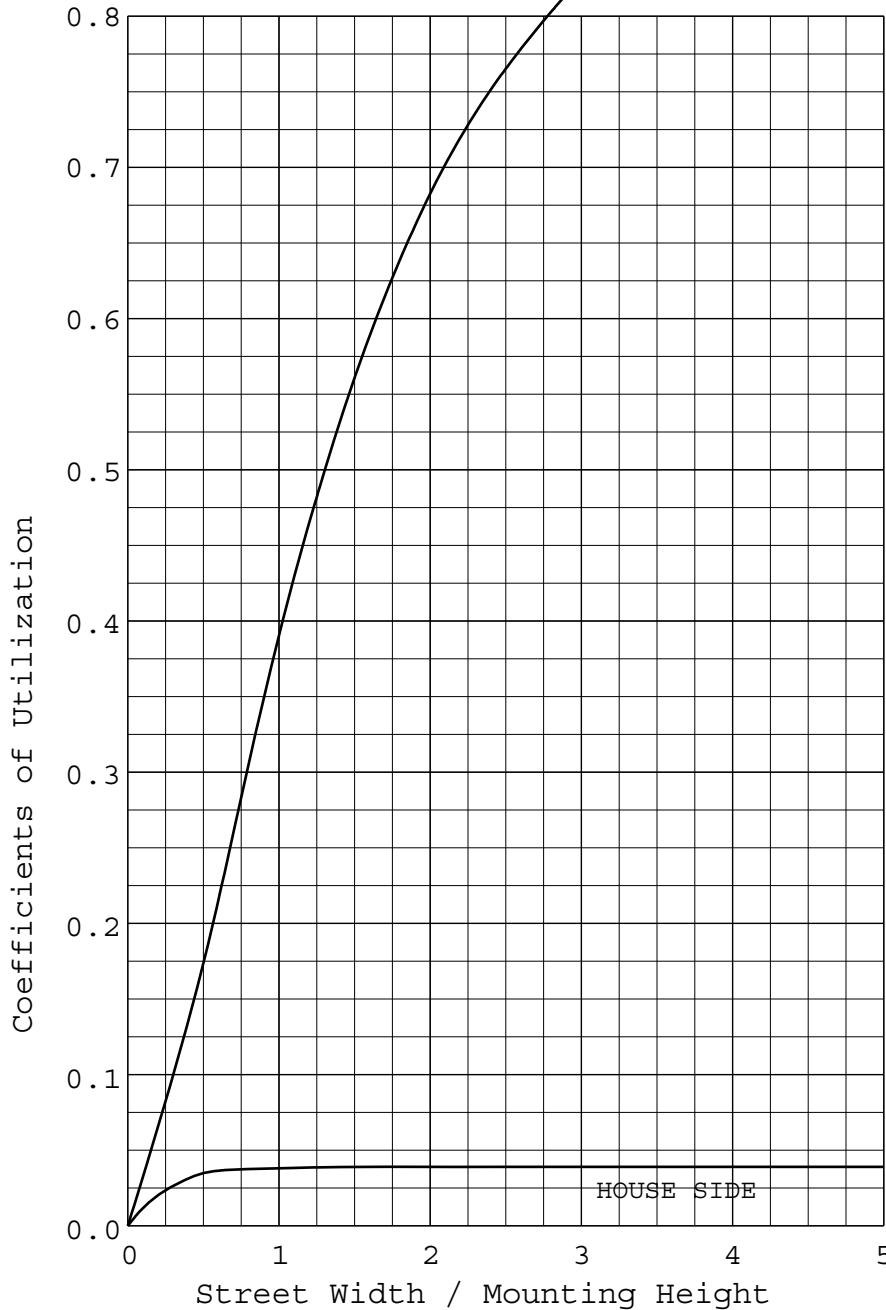
PAGE: 4 OF 9

ISSUE DATE: 05/10/16

DATE SAMPLE TESTED: 05/10/16

PREPARED FOR: RAB LIGHTING INC.

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	12375.	95.3
DOWNWARD HOUSE SIDE	520.	4.0
DOWNWARD TOTAL	12895.	99.4
UPWARD STREET SIDE	35.	0.3
UPWARD HOUSE SIDE	50.	0.4
UPWARD TOTAL	84.	0.6
TOTAL FLUX	12979.	100.0

TOTAL INPUT WATTS = 108.4
EFFICACY = 119.7 Lm/W

ALL CANDELA AND LUMENS IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

REPORT NUMBER: RAB01937
 ISSUE DATE: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.

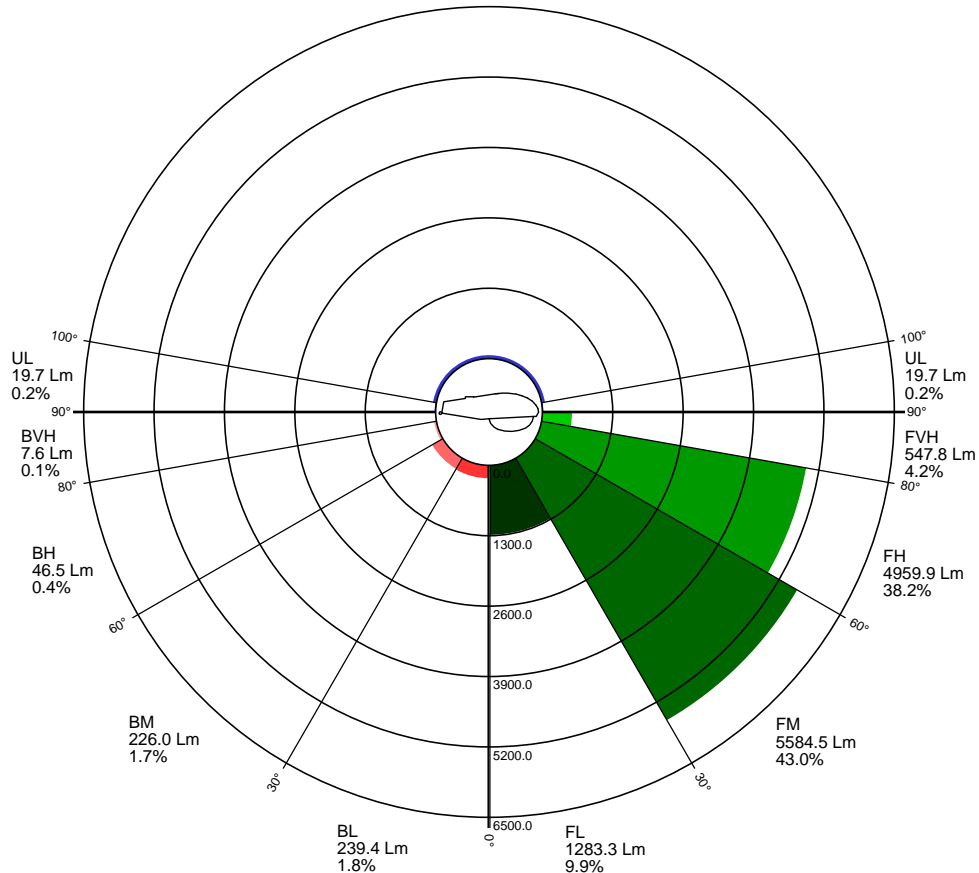
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 05/10/16

BUG Rating:				<div>B1 U3 G4</div>		
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		12375	95.3			
FL	(0° - 30°)	1283.3	9.9			
FM	(30° - 60°)	5584.5	43.0			
FH	(60° - 80°)	4959.9	38.2			G2
FVH	(80° - 90°)	547.8	4.2			G4
Backward		520	4.0			
BL	(0° - 30°)	239.4	1.8	B1		
BM	(30° - 60°)	226.0	1.7	B1		
BH	(60° - 80°)	46.5	0.4	B0		G0
BVH	(80° - 90°)	7.6	0.1			G0
Upward		84	0.6			
UL	(90° - 100°)	19.7	0.2		U2	
UH	(100° - 180°)	64.5	0.5		U3	
Trapped Light		0	0.0			
Total Flux		12979	100.0			

Zonal Lumen Summary

(Linear scale)

UH
64.5 Lm
0.5%

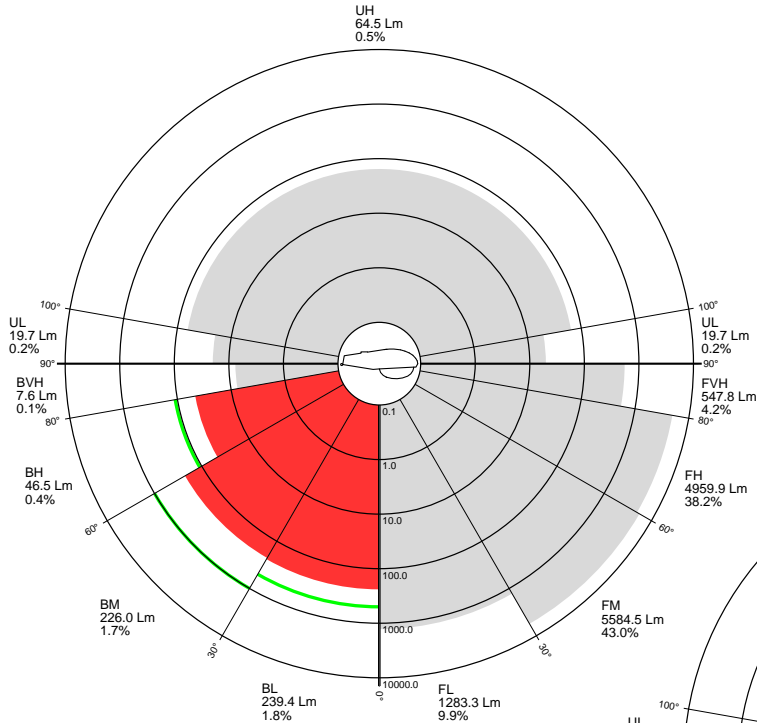


REPORT NUMBER: RAB01937
 ISSUE DATE: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 6 OF 9
 DATE SAMPLE TESTED: 05/10/16

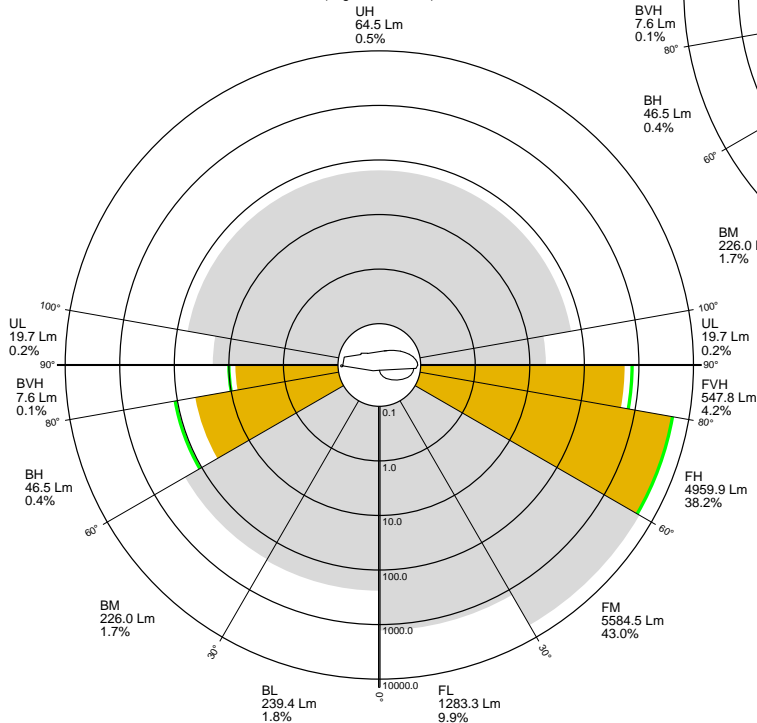
Backlight Rating Details

(Logarithmic scale)



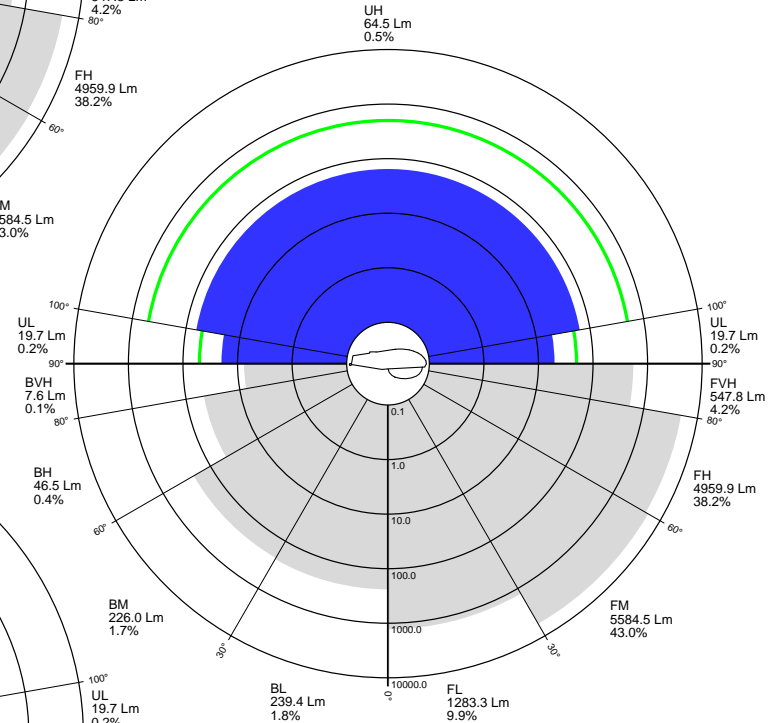
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB01937
 ISSUE DATE: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9
 DATE SAMPLE TESTED: 05/10/16

CANDELA TABULATION

	STREET SIDE	LATERAL ANGLE								
		0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0 85.0
	180.0	9.	9.	9.	9.	9.	9.	9.	9.	9.
	175.0	1.	1.	3.	6.	8.	10.	12.	14.	15. 16.
	165.0	0.	1.	3.	6.	8.	10.	12.	14.	16. 17.
	155.0	0.	1.	3.	6.	8.	10.	12.	14.	16. 17.
	145.0	0.	1.	3.	5.	8.	10.	12.	14.	15. 16.
	135.0	0.	1.	3.	5.	8.	10.	12.	13.	15. 16.
	125.0	0.	1.	3.	5.	8.	10.	12.	13.	14. 15.
	115.0	0.	1.	3.	5.	8.	10.	11.	13.	15. 16.
	105.0	0.	1.	3.	5.	8.	10.	12.	13.	15. 16.
	95.0	14.	13.	13.	11.	11.	12.	13.	13.	15. 16.
	90.0	105.	102.	105.	94.	80.	57.	46.	32.	18. 16.
	87.5	290.	292.	281.	260.	218.	171.	195.	223.	161. 21.
	85.0	686.	671.	700.	734.	827.	898.	1085.	845.	340. 48.
	82.5	2109.	2022.	2254.	2345.	2405.	2382.	2024.	1239.	476. 129.
V	80.0	4357.	4256.	4491.	4382.	3968.	3369.	2580.	1720.	551. 191.
E	77.5	6348.	6291.	6383.	6270.	4869.	4048.	3175.	1839.	732. 239.
R	75.0	7563.	7520.	7469.	7526.	5691.	4729.	3413.	1919.	902. 371.
T	72.5	8566.	8526.	8481.	8595.	6607.	5026.	3457.	2024.	1047. 500.
I	70.0	9494.	9460.	9326.	9219.	7125.	5021.	3454.	2151.	1185. 698.
C	67.5	10053.	10023.	9717.	9297.	7364.	4975.	3425.	2270.	1331. 817.
A	66.0	<10102.	10075.	9721.	9210.	7448.	5031.	3444.	2331.	1424. 874.
L	65.0	10084.	10059.	9671.	9087.	7442.	5077.	3467.	2367.	1481. 923.
	62.5	9882.	9846.	9418.	8710.	7425.	5214.	3543.	2444.	1642. 1013.
A	60.0	9537.	9490.	9092.	8357.	7313.	5414.	3721.	2517.	1807. 1031.
N	57.5	9203.	9149.	8781.	8001.	7068.	5580.	3950.	2589.	1981. 1018.
G	55.0	8820.	8773.	8372.	7686.	6812.	5674.	4133.	2752.	2192. 1068.
L	52.5	8451.	8398.	8049.	7420.	6575.	5678.	4240.	2947.	2337. 1153.
E	50.0	8118.	8087.	7735.	7173.	6299.	5581.	4303.	3138.	2498. 1169.
	47.5	7824.	7787.	7484.	6903.	6092.	5363.	4345.	3355.	2583. 1175.
	45.0	7502.	7479.	7158.	6661.	5872.	5110.	4374.	3571.	2626. 1154.
	42.5	7165.	7171.	6851.	6353.	5612.	4871.	4293.	3727.	2604. 1138.
	40.0	6829.	6815.	6516.	6047.	5360.	4768.	4218.	3750.	2534. 1135.
	37.5	6421.	6404.	6158.	5747.	5177.	4710.	4179.	3682.	2421. 1146.
	35.0	6027.	6009.	5819.	5494.	5089.	4603.	4200.	3586.	2312. 1153.
	30.0	5421.	5442.	5355.	5132.	4804.	4491.	4094.	3274.	2087. 1129.
	25.0	4968.	5000.	4937.	4806.	4580.	4184.	3558.	2690.	1778. 1027.
	20.0	4555.	4593.	4533.	4394.	4138.	3634.	2904.	2177.	1467. 952.
	15.0	3788.	3787.	3706.	3534.	3179.	2756.	2289.	1819.	1330. 1018.
	10.0	2568.	2581.	2465.	2399.	2191.	1969.	1681.	1408.	1164. 1014.
	5.0	1502.	1518.	1473.	1445.	1351.	1272.	1179.	1113.	1044. 992.
	0.0	979.	979.	979.	979.	979.	979.	979.	979.	979.
		PLANE OF MAXIMUM CANDELA								
		CONE OF MAXIMUM CANDELA								

REPORT NUMBER: RAB01937
 ISSUE DATE: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 05/10/16

CANDELA TABULATION

HOUSE SIDE

LATERAL ANGLE

	90.0	95.0	105.0	115.0	125.0	135.0	145.0	155.0	165.0	175.0	180.0
180.0	9.	9.	9.	9.	9.	9.	9.	9.	9.	9.	9.
175.0	17.	17.	16.	15.	13.	12.	10.	7.	5.	4.	4.
165.0	17.	17.	17.	16.	14.	13.	11.	9.	8.	8.	8.
155.0	17.	18.	17.	16.	15.	14.	12.	11.	11.	11.	11.
145.0	17.	17.	17.	16.	15.	14.	13.	13.	13.	13.	13.
135.0	16.	16.	16.	16.	15.	14.	14.	14.	14.	15.	15.
125.0	16.	16.	16.	15.	15.	14.	15.	16.	16.	17.	17.
115.0	16.	16.	16.	16.	16.	16.	17.	18.	19.	19.	19.
105.0	17.	17.	17.	17.	16.	17.	18.	19.	19.	20.	20.
95.0	17.	17.	17.	17.	16.	16.	17.	18.	18.	18.	18.
90.0	16.	16.	16.	16.	16.	15.	15.	15.	15.	14.	15.
87.5	17.	16.	16.	16.	15.	15.	13.	13.	12.	12.	12.
85.0	19.	17.	16.	15.	15.	14.	12.	10.	10.	10.	10.
82.5	39.	21.	16.	15.	14.	13.	11.	9.	8.	7.	8.
V 80.0	78.	31.	18.	15.	14.	12.	11.	8.	6.	5.	5.
E 77.5	106.	56.	28.	16.	14.	12.	10.	8.	5.	3.	4.
R 75.0	100.	79.	50.	19.	13.	12.	10.	7.	4.	2.	2.
T 72.5	281.	188.	41.	32.	14.	12.	10.	7.	5.	3.	3.
I 70.0	335.	224.	42.	41.	15.	12.	10.	8.	5.	3.	3.
C 67.5	410.	269.	46.	49.	21.	13.	10.	7.	5.	4.	4.
A 66.0<<	466.	333.	69.	48.	22.	13.	10.	7.	5.	4.	4.
L 65.0	489.	352.	102.	46.	24.	15.	11.	8.	5.	4.	4.
62.5	552.	369.	175.	36.	36.	20.	13.	10.	6.	5.	5.
A 60.0	544.	387.	222.	24.	42.	23.	21.	13.	11.	11.	11.
N 57.5	545.	409.	255.	31.	39.	33.	25.	21.	18.	18.	17.
G 55.0	588.	446.	299.	45.	30.	42.	31.	25.	28.	28.	28.
L 52.5	704.	535.	379.	121.	22.	43.	44.	29.	30.	32.	32.
E 50.0	745.	577.	433.	245.	23.	36.	47.	39.	37.	37.	37.
47.5	762.	592.	464.	359.	36.	25.	44.	43.	49.	50.	49.
45.0	767.	603.	492.	418.	93.	20.	35.	40.	50.	54.	54.
42.5	778.	628.	521.	446.	207.	31.	23.	32.	45.	49.	50.
40.0	804.	669.	555.	464.	301.	58.	22.	22.	33.	38.	40.
37.5	842.	707.	580.	476.	363.	139.	34.	20.	22.	25.	26.
35.0	877.	737.	595.	482.	383.	239.	76.	33.	26.	23.	22.
30.0	907.	752.	605.	486.	405.	356.	295.	224.	133.	98.	87.
25.0	865.	713.	590.	498.	441.	434.	451.	453.	414.	392.	384.
20.0	840.	716.	625.	583.	550.	546.	531.	514.	498.	488.	484.
15.0	944.	849.	750.	703.	661.	622.	595.	582.	566.	559.	556.
10.0	967.	912.	799.	757.	725.	704.	685.	674.	659.	655.	652.
5.0	966.	941.	879.	829.	803.	789.	774.	770.	762.	762.	757.
0.0	979.	979.	979.	979.	979.	979.	979.	979.	979.	979.	979.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01937
 ISSUE DATE: 05/10/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
 DATE SAMPLE TESTED: 05/10/16

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	24
5- 10	84
10- 15	175
15- 20	291
20- 25	413
25- 30	536
30- 35	654
35- 40	779
40- 45	916
45- 50	1047
50- 55	1158
55- 60	1256
60- 65	1345
65- 70	1388
70- 75	1283
75- 80	990
80- 85	473
85- 90	83
90- 95	12
95-100	8
100-105	7
105-110	7
110-115	7
115-120	6
120-125	6
125-130	5
130-135	5
135-140	4
140-145	4
145-150	4
150-155	3
155-160	2
160-165	2
165-170	1
170-175	1
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	108
0- 20	574
0- 30	1523
0- 40	2955
0- 50	4919
0- 60	7333
0- 70	10066
0- 80	12340
0- 90	12895
0-100	12915
0-110	12929
0-120	12942
0-130	12953
0-140	12962
0-150	12970
0-160	12975
0-170	12978
0-180	12979

REPORT NUMBER: RAB01938
DATE: 5/10/2016
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: WPLEDC104Y / ALEDC104Y (7.5-DEGREE UPTILT)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED METAL HOUSING, 2-PIECE EXTRUDED METAL HEAT SINK, 4 CIRCUIT BOARDS EACH WITH 1 LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 OPTICAL COMPARTMENT WITH 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL FRAME.

LAMP: FOUR WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), TILTED 37.5-DEGREES FROM VERTICAL BASE-UP POSITION, 2 LEDS CANTED 12-DEGREES FROM STRAIGHT AHEAD.

DRIVER: RD-120-A0700

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (120.0 AND 277.0 VAC, 60Hz) TO THE TEST SAMPLE.

INSTRUMENTS:	GWINSTEK PROGRAMMABLE AC POWER SOURCE APS-7100	Calibration Due: N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	2/26/17
	OCEAN OPTICS QE65PRO Spectroradiometer	4/4/17
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	4/4/17

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Total Radiant Flux*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRIa,1-14), Chromaticity Coordinates (x,y; u'v'), ANSI C78.377 Duv, and electrical data including ANSI C82.77-2002 Power Factor (PF), and Total Harmonic Distortion (THD) to the test sample. Measure electrical data including Total Harmonic Distortion (THD) at maximum nominal rated input voltage. Report Off-State Power.

PROCEDURE: The test sample was mounted inside the integrating sphere, energized, and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were recorded and averaged. Readings were taken with the test sample operating at 60 HZ input in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. Electrical data was also recorded at maximum nominal rated input voltage (277.0 VAC). All data are traceable to the National Institute of Standards and Technology. Off-State Power was reported with no voltage applied to the sample.

*NOTE: Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

RESULTS: (continued subsequent pages)

Checked X.CAO

Approved D.WANG-MUNSON
Lighting Engineer

REPORT NUMBER: RAB01938
 DATE: 5/10/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WPLEDC104Y / ALEDC104Y (7.5-DEGREE UPTILT)

Page 2 of 4

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	12979 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4304
Chromaticity Ordinate y	0.4081
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2447
Chromaticity Ordinate v'	0.5220
Correlated Color Temp CCT (K)	3144
ANSI C78.377-2008 Duv	0.003
Total Radiant Flux (milliWatts)	36251 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.906
Input Power (Watts)	108.4
Input Power Factor (%)	99.6
Input Current THD (%)	4.9
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	119.7
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.418
Input Power (Watts)	106.6
Input Power Factor (%)	92.0
Input Current THD (%)	9.8
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	70
R1 Light greyish red	66
R2 Dark greyish yellow	79
R3 Strong yellowish green	90
R4 Moderate yellowish green	67
R5 Light bluish green	65
R6 Light blue	70
R7 Light violet	79
R8 Light reddish purple	44
R9 Strong red	-37
R10 Strong yellow	51
R11 Strong green	61
R12 Strong blue	41
R13 Light yellowish pink (skin)	68
R14 Moderate olive green (leaf)	94

*NOTE:

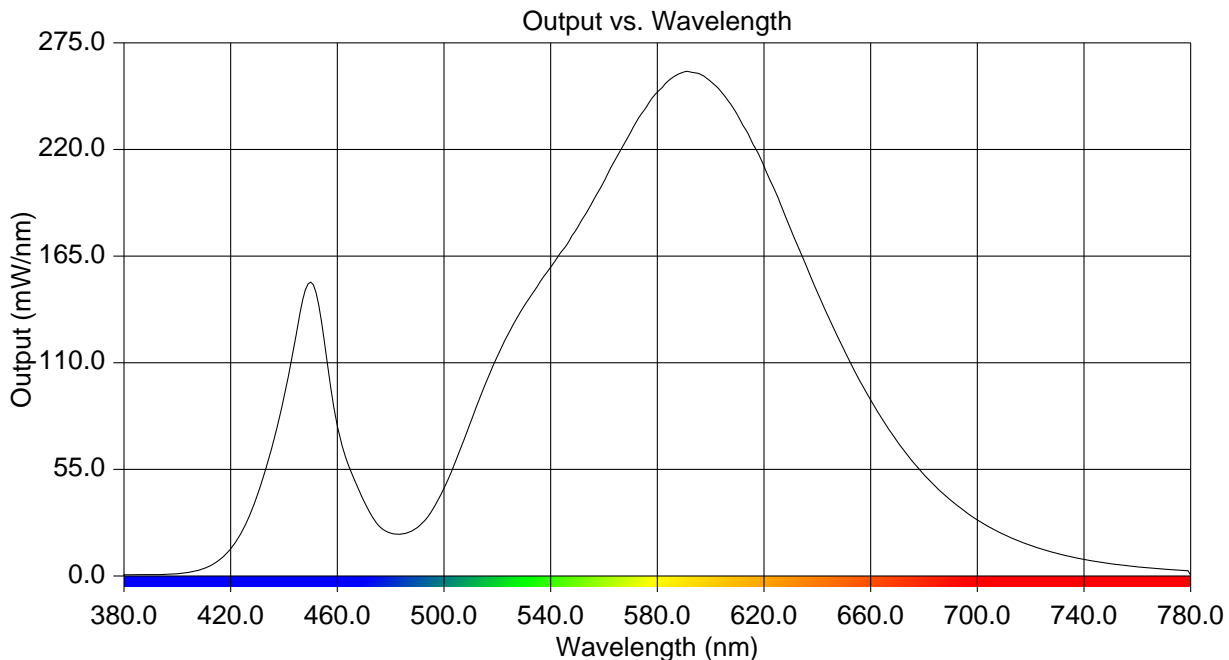
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

REPORT NUMBER: RAB01938
 DATE: 5/10/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WPLED104Y / ALED104Y (7.5-DEGREE UPTILT)

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.601	515	97.334	650	116.735
385	0.614	520	113.045	655	102.977
390	0.711	525	127.479	660	90.702
395	0.841	530	139.124	665	79.453
400	1.169	535	149.329	670	69.398
405	2.042	540	159.242	675	60.224
410	3.856	545	168.828	680	52.239
415	7.517	550	179.473	685	45.185
420	14.073	555	191.109	690	39.031
425	25.049	560	203.411	695	33.754
430	41.720	565	216.691	700	28.870
435	64.102	570	228.778	705	24.874
440	91.910	575	240.059	710	21.351
445	128.493	580	249.443	715	18.415
450	151.531	585	256.130	720	15.758
455	122.237	590	259.908	725	13.491
460	77.380	595	259.287	730	11.562
465	54.260	600	254.937	735	9.938
470	38.578	605	247.890	740	8.505
475	26.931	610	237.788	745	7.334
480	22.051	615	225.221	750	6.365
485	21.844	620	211.387	755	5.474
490	24.923	625	195.912	760	4.715
495	32.615	630	178.864	765	4.091
500	45.291	635	162.723	770	3.547
505	61.337	640	146.351	775	3.044
510	79.293	645	131.198	780	0.460



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Page 4 of 4

CIE Chromaticity Diagram

