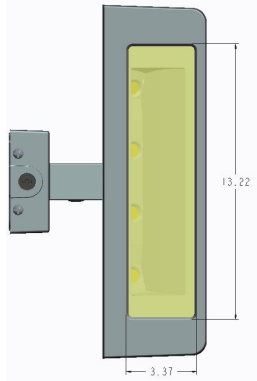


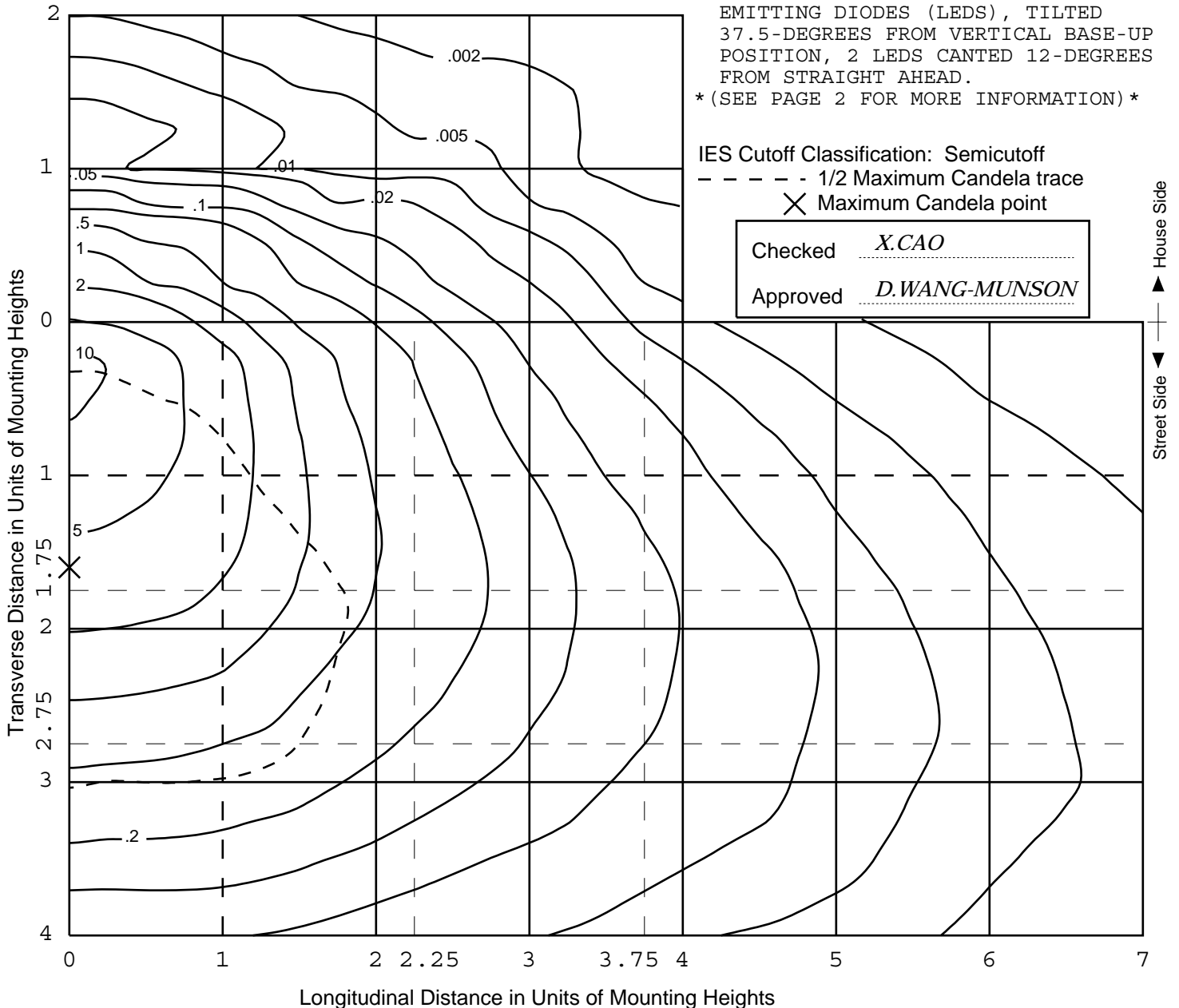
## ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 20 foot mounting height.



REPORT NUMBER: RAB01959  
ISSUE DATE: 05/12/16 PAGE: 1 OF 9  
DATE SAMPLE TESTED: 05/12/16  
PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: WPLEDC104Y/480 /  
ALEDC104Y/480 (7.5-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  
37.5-DEGREES FROM VERTICAL BASE-UP  
POSITION, 2 LEDS CANTED 12-DEGREES  
FROM STRAIGHT AHEAD.  
\*(SEE PAGE 2 FOR MORE INFORMATION)\*

IES Cutoff Classification: Semicutoff  
- - - - 1/2 Maximum Candela trace  
X Maximum Candela point



REPORT NUMBER: RAB01959  
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PREPARED FOR: RAB LIGHTING INC.

PAGE: 2 OF 9  
DATE SAMPLE TESTED: 05/12/16

ADDITIONAL INFORMATION

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS = 113.04 W AT 480.0 VAC.

LED DRIVER: RD-T150-A-700/480

TEST PROCEDURE: IESNA LM-79-08

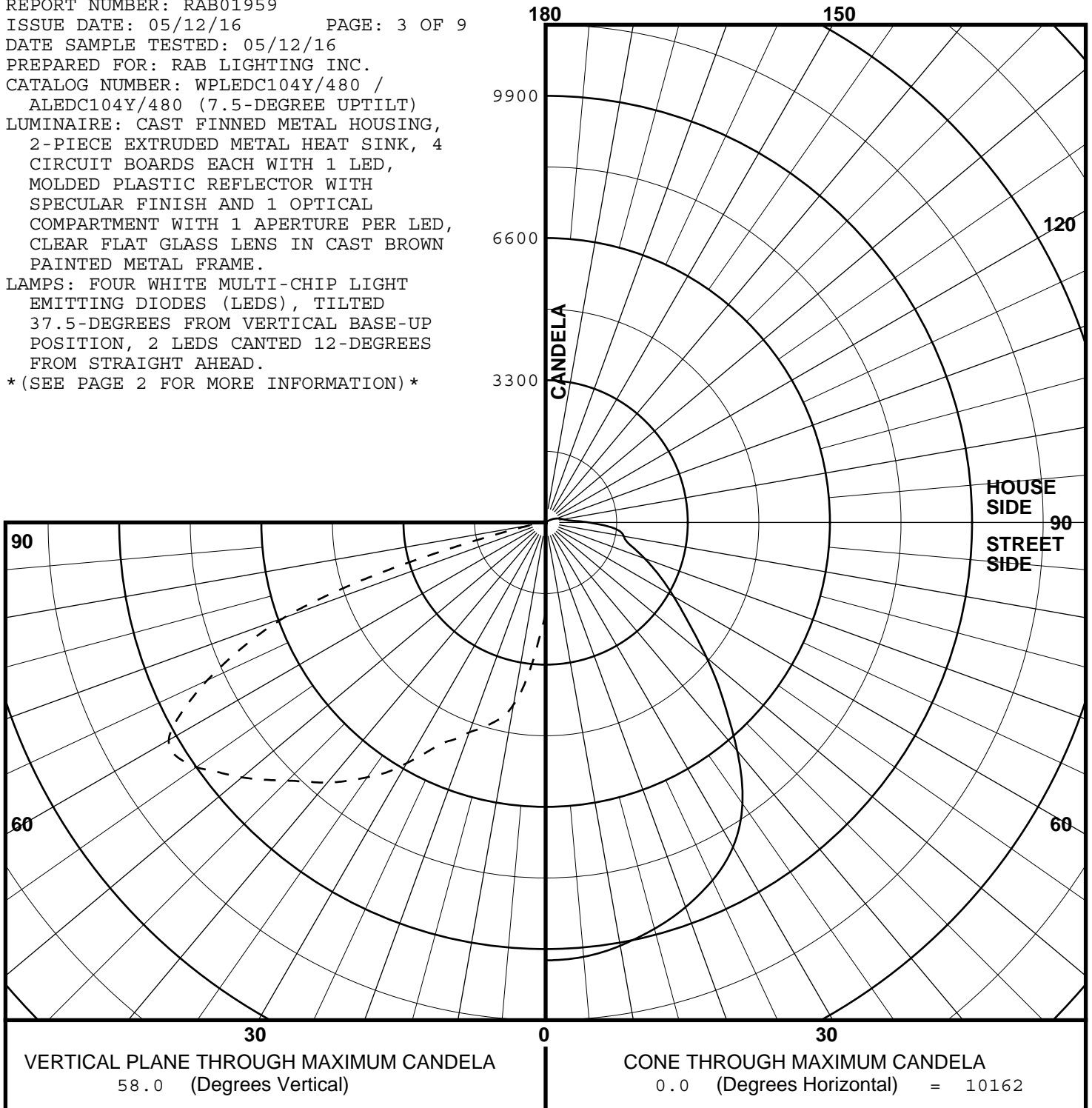
ACCREDITED LABORATORY CODE 201058-0

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: RAB01959  
 ISSUE DATE: 05/12/16 PAGE: 3 OF 9  
 DATE SAMPLE TESTED: 05/12/16  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: WPLEDC104Y/480 /  
 ALEDC104Y/480 (7.5-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  
 37.5-DEGREES FROM VERTICAL BASE-UP  
 POSITION, 2 LEDS CANTED 12-DEGREES  
 FROM STRAIGHT AHEAD.  
 \*(SEE PAGE 2 FOR MORE INFORMATION) \*

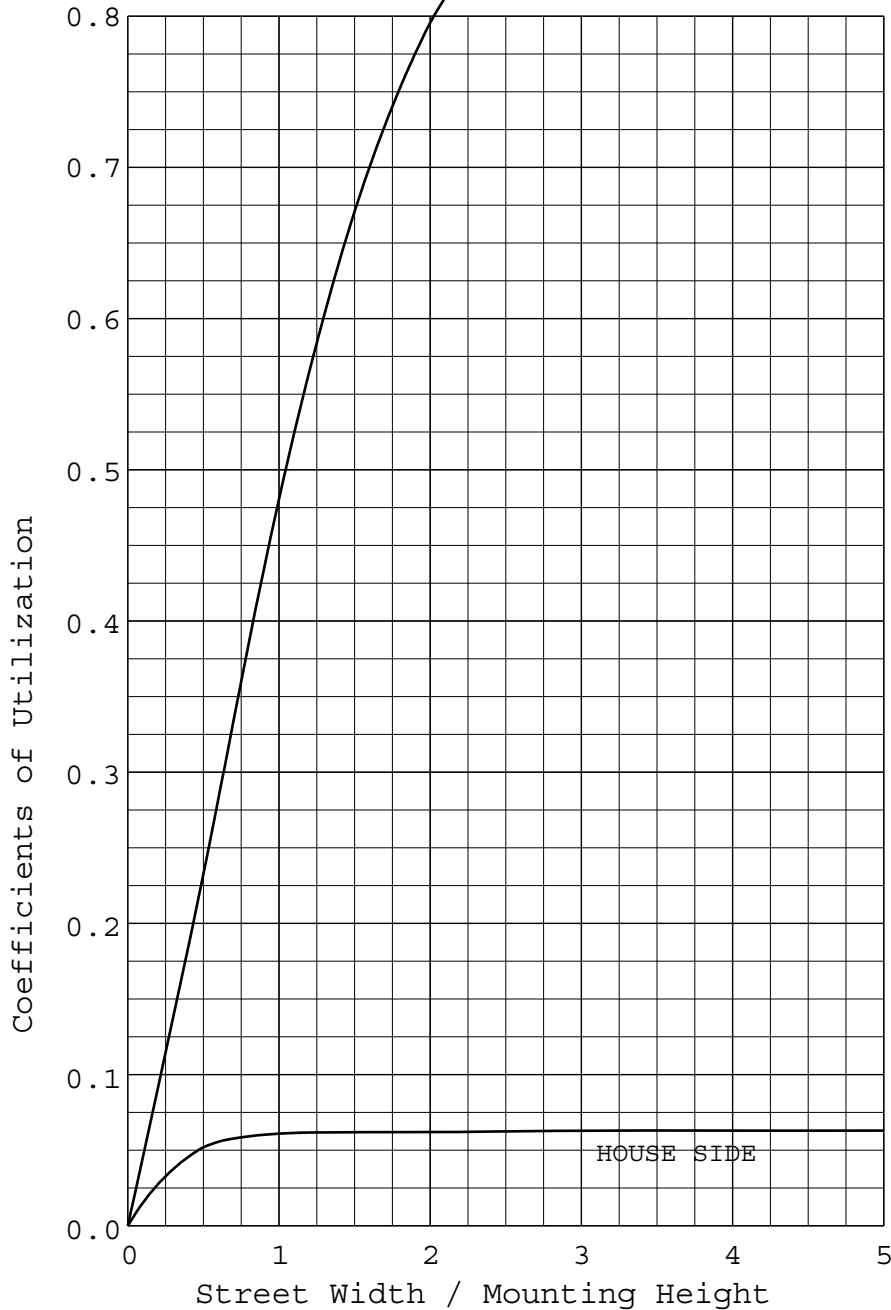


REPORT NUMBER: RAB01959  
ISSUE DATE: 05/12/16  
PREPARED FOR: RAB LIGHTING INC.

STREET SIDE

PAGE: 4 OF 9  
DATE SAMPLE TESTED: 05/12/16

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	12171.	93.6
DOWNWARD HOUSE SIDE	826.	6.4
DOWNWARD TOTAL	12997.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	12997.	100.0
TOTAL INPUT WATTS = 113.0		
EFFICACY = 115.0 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: RAB01959  
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 PREPARED FOR: RAB LIGHTING INC.

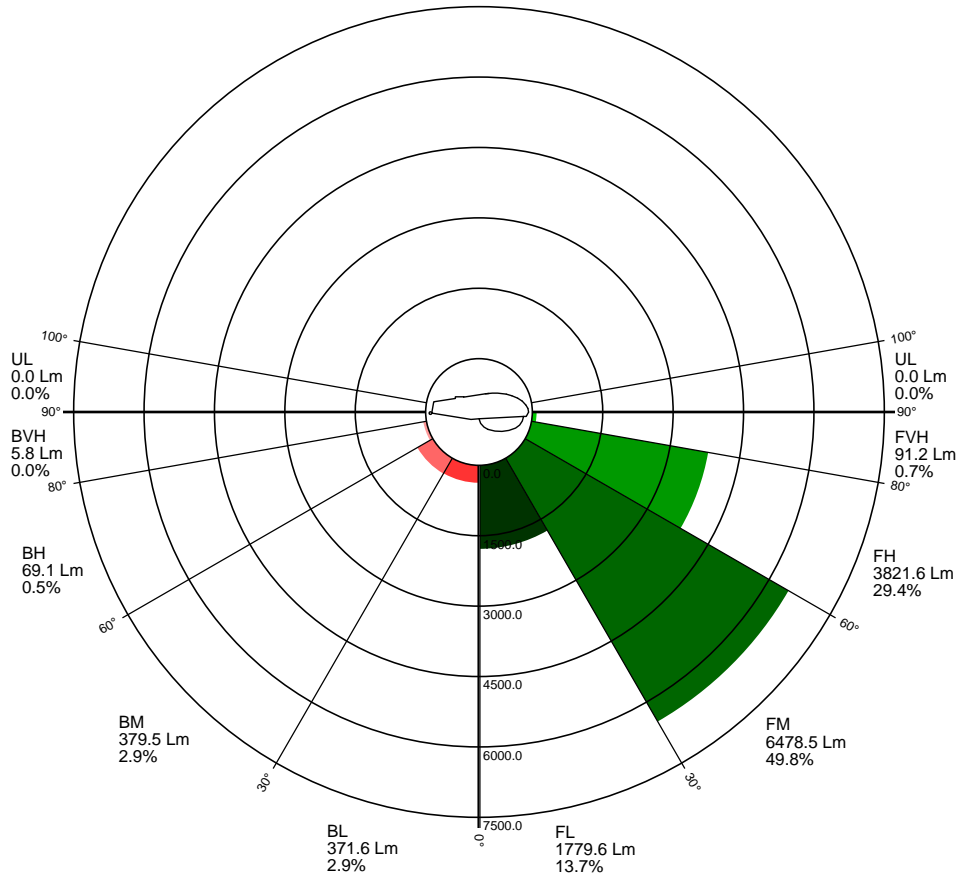
PAGE: 5 OF 9  
 DATE SAMPLE TESTED: 05/12/16

BUG Rating:				B1 U0 G2		
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		12171	93.6			
FL	(0° - 30°)	1779.6	13.7			
FM	(30° - 60°)	6478.5	49.8			
FH	(60° - 80°)	3821.6	29.4			G2
FVH	(80° - 90°)	91.2	0.7			G1
Backward		826	6.4			
BL	(0° - 30°)	371.6	2.9	B1		
BM	(30° - 60°)	379.5	2.9	B1		
BH	(60° - 80°)	69.1	0.5	B0		G0
BVH	(80° - 90°)	5.8	0.0			G0
Upward		0	0.0			
UL	(90° - 100°)	0.0	0.0		U0	
UH	(100° - 180°)	0.0	0.0		U0	
Trapped Light		0	0.0			
Total Flux		12997	100.0			

### Zonal Lumen Summary

(Linear scale)

UH  
0.0 Lm  
0.0%

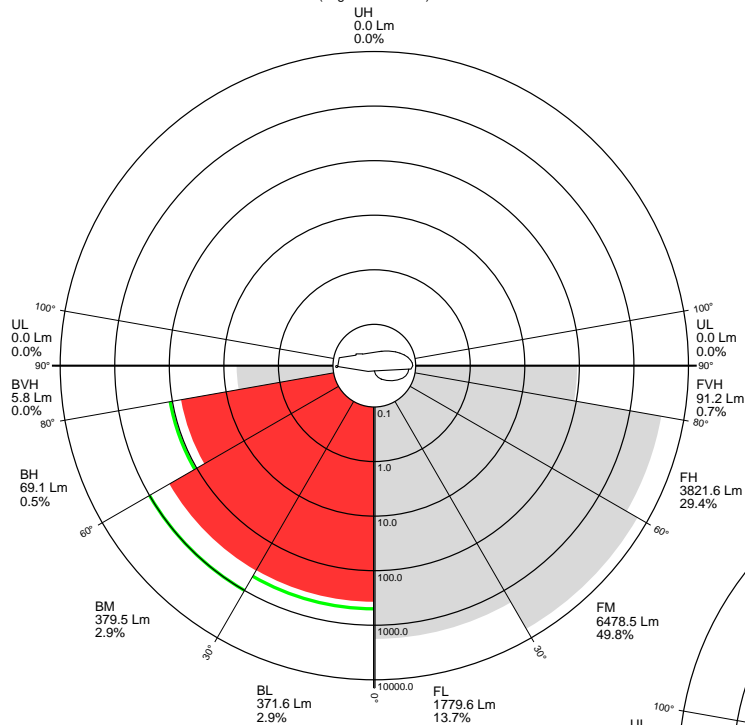


REPORT NUMBER: RAB01959  
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DATE SAMPLE TESTED: 05/12/16

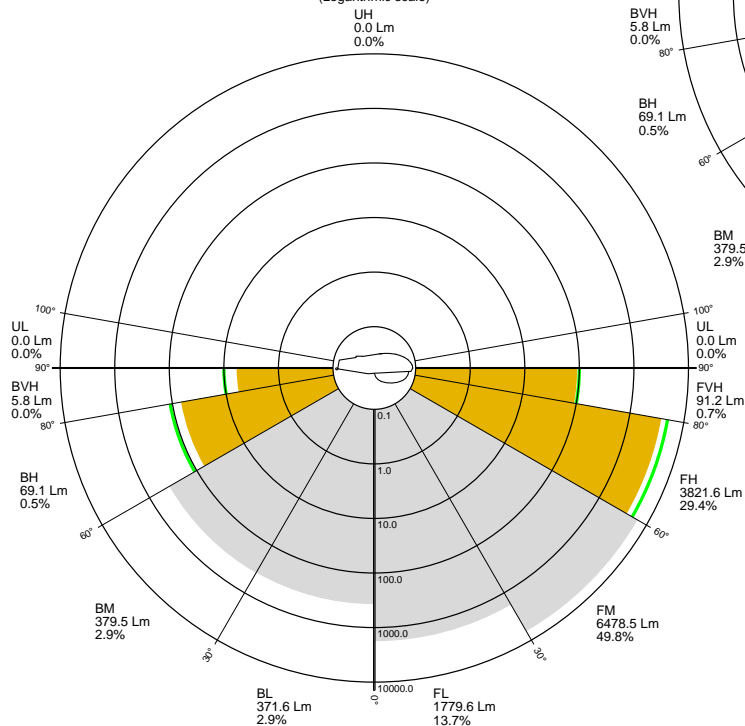
### Backlight Rating Details

(Logarithmic scale)



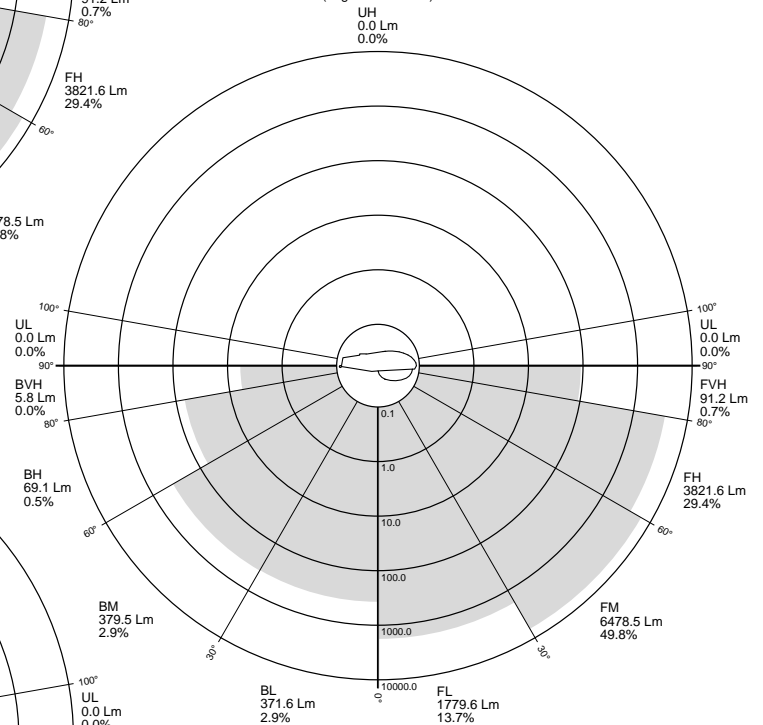
### Glare Rating Details

(Logarithmic scale)



### Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB01959  
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 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9  
 DATE SAMPLE TESTED: 05/12/16

### 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
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	17.	15.	17.	15.	16.	18.	19.	26.	19.
	85.0	22.	24.	30.	30.	42.	52.	78.	141.	217. 38.
	82.5	126.	123.	146.	156.	161.	167.	406.	730.	417. 124.
	80.0	306.	303.	321.	350.	444.	790.	1471.	1199.	574. 200.
	77.5	759.	709.	858.	1086.	1562.	2263.	2290.	1787.	697. 268.
	75.0	2088.	2120.	2615.	2994.	3277.	3359.	2900.	2073.	918. 365.
	72.5	4517.	4335.	4841.	5185.	4551.	4051.	3486.	2192.	1106. 532.
	70.0	6464.	6344.	6563.	6813.	5409.	4765.	3753.	2302.	1296. 769.
V	67.5	7657.	7634.	7634.	8006.	6477.	5288.	3824.	2427.	1458. 1016.
E	65.0	8668.	8597.	8617.	8933.	7360.	5428.	3819.	2556.	1628. 1194.
R	62.5	9514.	9522.	9463.	9407.	7820.	5503.	3861.	2699.	1788. 1415.
T	60.0	10105.	10072.	9793.	9368.	7992.	5671.	3922.	2829.	1931. 1547.
I	58.0	<10162.	10119.	9762.	9163.	7968.	5835.	4052.	2913.	2037. 1614.
C	57.5	10137.	10090.	9729.	9101.	7943.	5872.	4099.	2930.	2068. 1628.
A	55.0	9902.	9863.	9449.	8751.	7844.	6065.	4383.	3085.	2220. 1755.
L	52.5	9535.	9496.	9137.	8502.	7564.	6179.	4677.	3279.	2412. 1885.
	50.0	9204.	9174.	8854.	8198.	7261.	6246.	4906.	3473.	2636. 1971.
A	47.5	8837.	8834.	8468.	7902.	6989.	6202.	5025.	3694.	2903. 2091.
N	45.0	8474.	8467.	8138.	7623.	6775.	6032.	5049.	3925.	3191. 2183.
G	42.5	8163.	8150.	7819.	7366.	6565.	5816.	4964.	4092.	3451. 2297.
L	40.0	7881.	7840.	7559.	7094.	6375.	5577.	4810.	4151.	3621. 2404.
E	37.5	7558.	7525.	7231.	6845.	6157.	5397.	4689.	4161.	3685. 2442.
	35.0	7217.	7217.	6956.	6556.	5916.	5235.	4660.	4167.	3682. 2446.
	30.0	6450.	6449.	6267.	5907.	5464.	5054.	4606.	4257.	3640. 2473.
	25.0	5650.	5677.	5602.	5431.	5172.	4829.	4557.	4177.	3463. 2431.
	20.0	5183.	5212.	5170.	5080.	4897.	4707.	4372.	3891.	3117. 2284.
	15.0	4822.	4845.	4818.	4753.	4628.	4416.	4071.	3565.	2924. 2312.
	10.0	4293.	4317.	4272.	4170.	3999.	3766.	3406.	3070.	2659. 2265.
	5.0	3170.	3188.	3173.	3108.	2965.	2847.	2668.	2538.	2362. 2174.
	0.0	2103.	2103.	2103.	2103.	2103.	2103.	2103.	2103.	2103.

||  
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01959  
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 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9  
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### 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
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	17.	16.	15.	14.	13.	12.	10.	8.	5.	5.
	85.0	21.	18.	16.	15.	13.	11.	9.	7.	5.	3.
	82.5	60.	24.	18.	15.	13.	11.	9.	7.	4.	3.
	80.0	104.	51.	24.	17.	13.	11.	9.	7.	5.	3.
	77.5	144.	81.	40.	32.	13.	11.	9.	7.	5.	4.
	75.0	188.	98.	30.	39.	16.	11.	9.	7.	5.	5.
	72.5	364.	239.	46.	57.	22.	12.	9.	7.	5.	4.
	70.0	523.	275.	105.	52.	27.	16.	11.	8.	6.	5.
V	67.5	644.	363.	197.	32.	40.	21.	16.	12.	10.	11.
E	65.0	770.	451.	251.	25.	44.	26.	22.	20.	16.	16.
R	62.5	900.	501.	271.	39.	36.	37.	26.	24.	25.	27.
T	60.0	963.	516.	300.	104.	22.	41.	38.	28.	28.	31.
I	58.0<<	999.	539.	336.	189.	19.	39.	44.	37.	33.	34.
C	57.5	1005.	546.	344.	213.	21.	37.	44.	39.	36.	36.
A	55.0	1103.	617.	404.	338.	39.	25.	42.	43.	46.	49.
L	52.5	1244.	750.	487.	415.	121.	20.	34.	41.	48.	54.
	50.0	1321.	817.	517.	460.	267.	32.	22.	32.	43.	49.
A	47.5	1406.	868.	547.	488.	381.	85.	23.	22.	33.	38.
N	45.0	1478.	918.	582.	511.	428.	190.	37.	20.	22.	25.
G	42.5	1561.	971.	630.	540.	444.	296.	94.	34.	26.	23.
L	40.0	1655.	1052.	678.	568.	461.	357.	199.	89.	45.	37.
E	37.5	1748.	1146.	723.	593.	477.	379.	299.	218.	137.	100.
	35.0	1809.	1246.	764.	617.	489.	402.	355.	358.	290.	246.
	30.0	1914.	1409.	852.	639.	516.	451.	453.	481.	475.	467.
	25.0	1936.	1490.	889.	654.	580.	559.	563.	554.	536.	526.
	20.0	1905.	1551.	1007.	807.	716.	700.	667.	635.	612.	603.
	15.0	2034.	1769.	1296.	1031.	907.	799.	757.	734.	714.	709.
	10.0	2082.	1906.	1569.	1290.	1121.	1027.	963.	907.	860.	855.
	5.0	2087.	2002.	1833.	1683.	1561.	1468.	1371.	1295.	1261.	1269.
	0.0	2103.	2103.	2103.	2103.	2103.	2103.	2103.	2103.	2103.	2103.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01959  
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PAGE: 9 OF 9  
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5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	51
5- 10	162
10- 15	290
15- 20	417
20- 25	546
25- 30	686
30- 35	831
35- 40	968
40- 45	1101
45- 50	1224
50- 55	1329
55- 60	1405
60- 65	1405
65- 70	1240
70- 75	875
75- 80	371
80- 85	87
85- 90	10

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	213
0- 20	919
0- 30	2151
0- 40	3950
0- 50	6275
0- 60	9009
0- 70	11653
0- 80	12900
0- 90	12997

REPORT NUMBER: RAB01960  
DATE: 5/12/2016  
PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: WPLEDC104Y/480 / ALEDC104Y/480 (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-T150-A-700/480

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (480.0 AND 347.0 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 (347.0 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	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u> Lighting Engineer

REPORT NUMBER: RAB01960  
 DATE: 5/12/2016  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: WPLEDC104Y/480 / ALEDC104Y/480 (7.5-DEGREE UPTILT)

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### RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	12997 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4306
Chromaticity Ordinate y	0.4080
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2449
Chromaticity Ordinate v'	0.5220
Correlated Color Temp CCT (K)	3140
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	36313 *
ELECTRICAL	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.254
Input Power (Watts)	113.0
Input Power Factor (%)	92.7
Input Current THD (%)	20.9
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	115.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.331
Input Power (Watts)	112.1
Input Power Factor (%)	97.6
Input Current THD (%)	17.6
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:

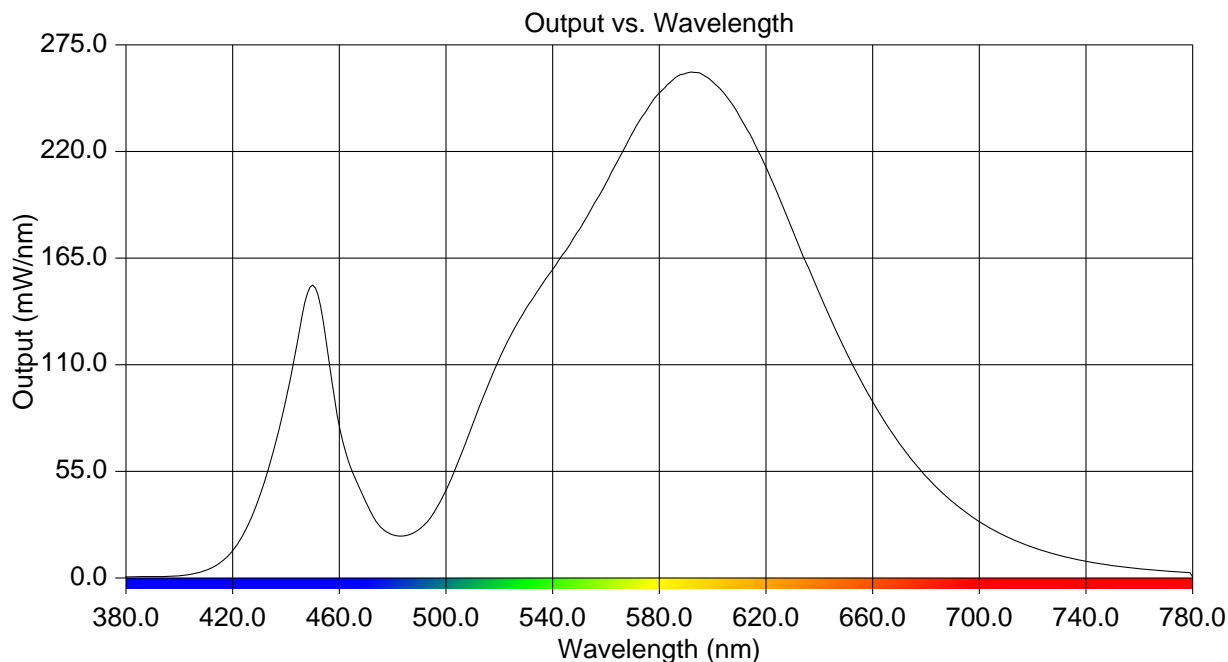
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB01960  
 DATE: 5/12/2016  
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 CATALOG NUMBER: WPLED104Y/480 / ALED104Y/480 (7.5-DEGREE UPTILT)

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### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.565	515	96.674	650	116.651
385	0.693	520	112.892	655	103.292
390	0.677	525	126.974	660	90.833
395	0.795	530	138.933	665	79.624
400	1.202	535	149.251	670	69.400
405	2.061	540	159.075	675	60.461
410	3.847	545	168.926	680	52.433
415	7.598	550	179.578	685	45.330
420	13.994	555	191.685	690	39.183
425	25.186	560	203.643	695	33.873
430	41.793	565	216.496	700	29.060
435	64.261	570	229.645	705	24.996
440	91.623	575	240.597	710	21.435
445	127.676	580	250.042	715	18.449
450	151.051	585	256.749	720	15.825
455	122.647	590	260.263	725	13.598
460	78.174	595	260.494	730	11.683
465	54.420	600	255.835	735	10.016
470	39.038	605	248.585	740	8.567
475	27.057	610	238.261	745	7.417
480	22.220	615	226.189	750	6.426
485	21.900	620	211.921	755	5.500
490	25.148	625	196.303	760	4.794
495	32.649	630	179.096	765	4.113
500	45.296	635	162.599	770	3.538
505	61.405	640	146.918	775	3.091
510	79.200	645	131.425	780	0.468



REPORT NUMBER: RAB01960  
DATE: 5/12/2016  
PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: WPLED104Y/480 / ALED104Y/480 (7.5-DEGREE UPTILT)

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## CIE Chromaticity Diagram

