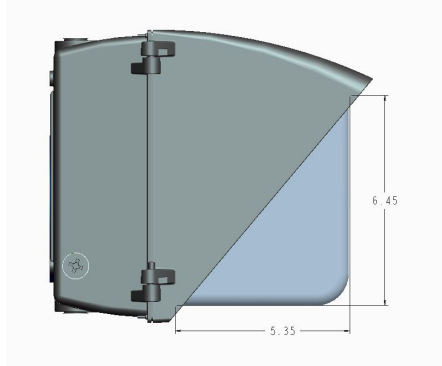


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

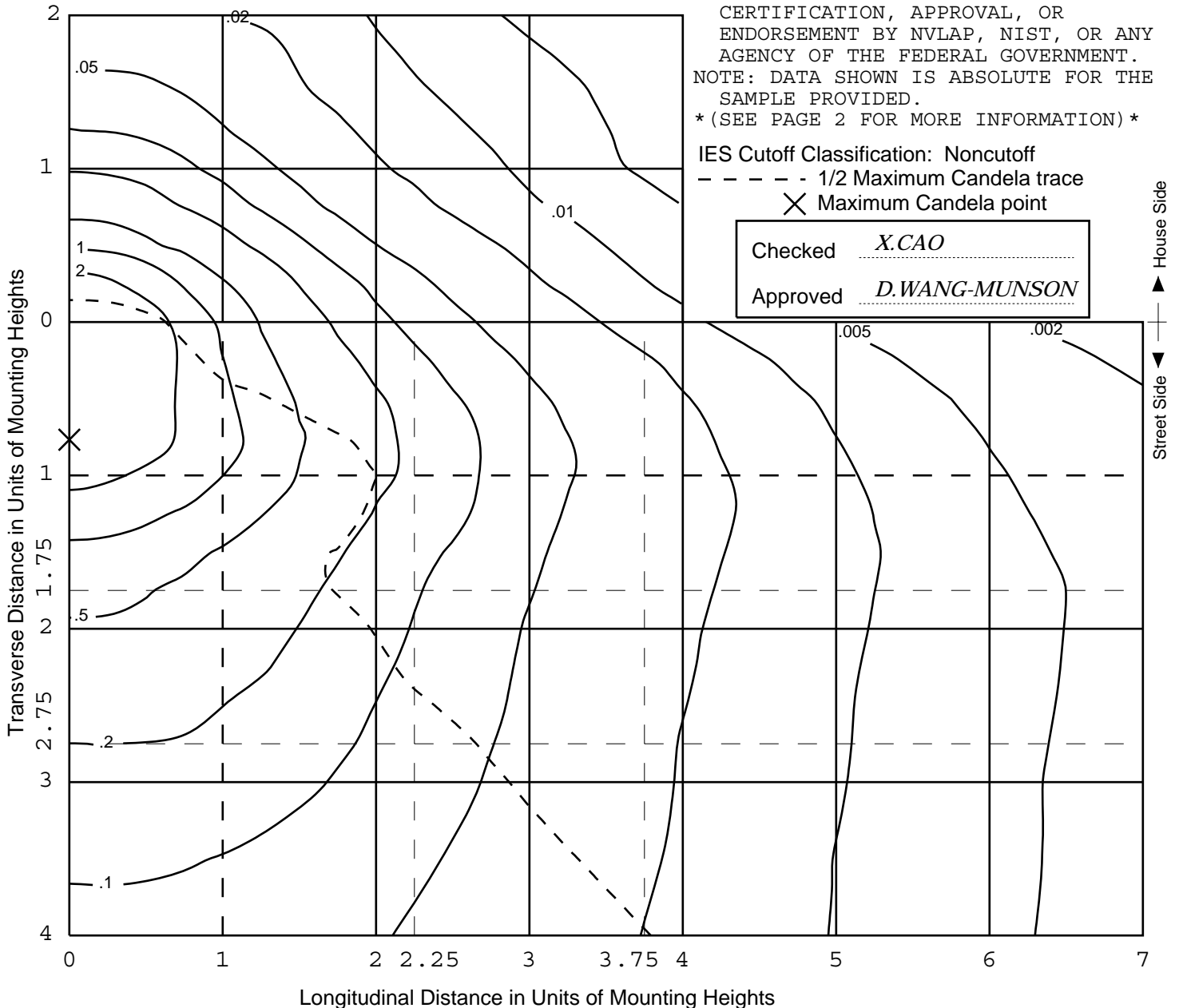
Values based on 20 foot mounting height.



REPORT NUMBER: RAB03137
 ISSUE DATE: 03/31/17 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 03/31/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65, WP3LED65/D10
 (STANDARD CUTOFF - PRISMATIC GLASS LENS)
 LUMINAIRE: LARGE WALLPACK WITH ALUMINUM PRECISION DIE CAST CONSTRUCTION AND TEMPERED GLASS REFRACTOR.
 LAMP: ONE HUNDRED FORTY FOUR WHITE LIGHT EMITTING DIODES (LEDs).
 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.
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
 (SEE PAGE 2 FOR MORE INFORMATION)

IES Cutoff Classification: Noncutoff

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



REPORT NUMBER: RAB03137
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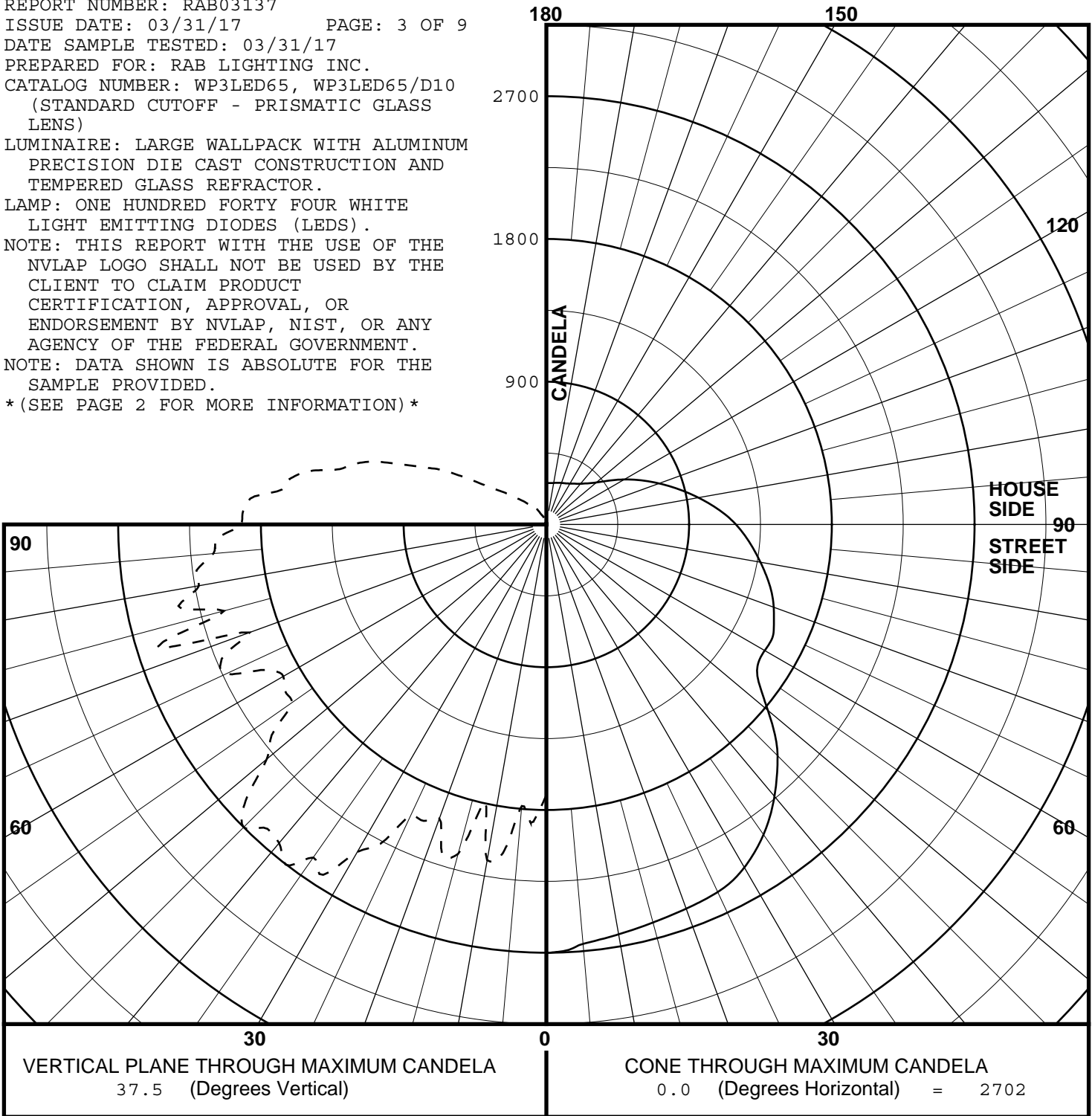
PAGE: 2 OF 9
DATE SAMPLE TESTED: 03/31/17

ADDITIONAL INFORMATION

TOTAL INPUT WATTS = 61.684 W AT 120.0 VAC.
LED DRIVER: RD-G075-A2800-C
TEST PROCEDURE: IESNA LM-79-08
LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE
AMBIENT: 24.7
ACCREDITED LABORATORY CODE 201058-0

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

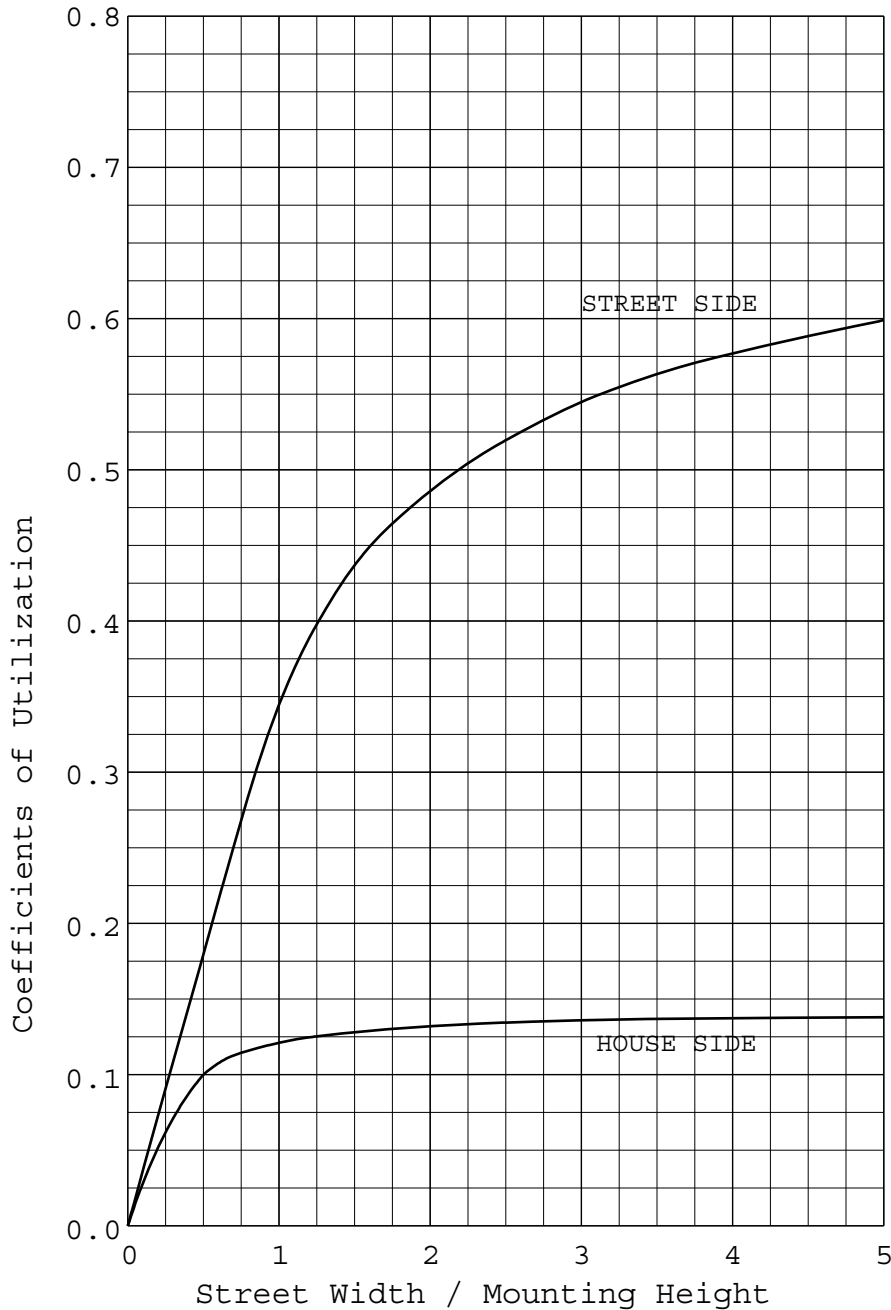
REPORT NUMBER: RAB03137
ISSUE DATE: 03/31/17 PAGE: 3 OF 9
DATE SAMPLE TESTED: 03/31/17
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: WP3LED65, WP3LED65/D10
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(SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB03137
ISSUE DATE: 03/31/17
PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9
DATE SAMPLE TESTED: 03/31/17

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	5149.	68.1
DOWNWARD HOUSE SIDE	1060.	14.0
DOWNWARD TOTAL	6210.	82.1
UPWARD STREET SIDE	1300.	17.2
UPWARD HOUSE SIDE	49.	0.6
UPWARD TOTAL	1349.	17.9
TOTAL FLUX	7559.	100.0

TOTAL INPUT WATTS = 61.7
EFFICACY = 122.5 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: RAB03137
 ISSUE DATE: 03/31/17
 PREPARED FOR: RAB LIGHTING INC.

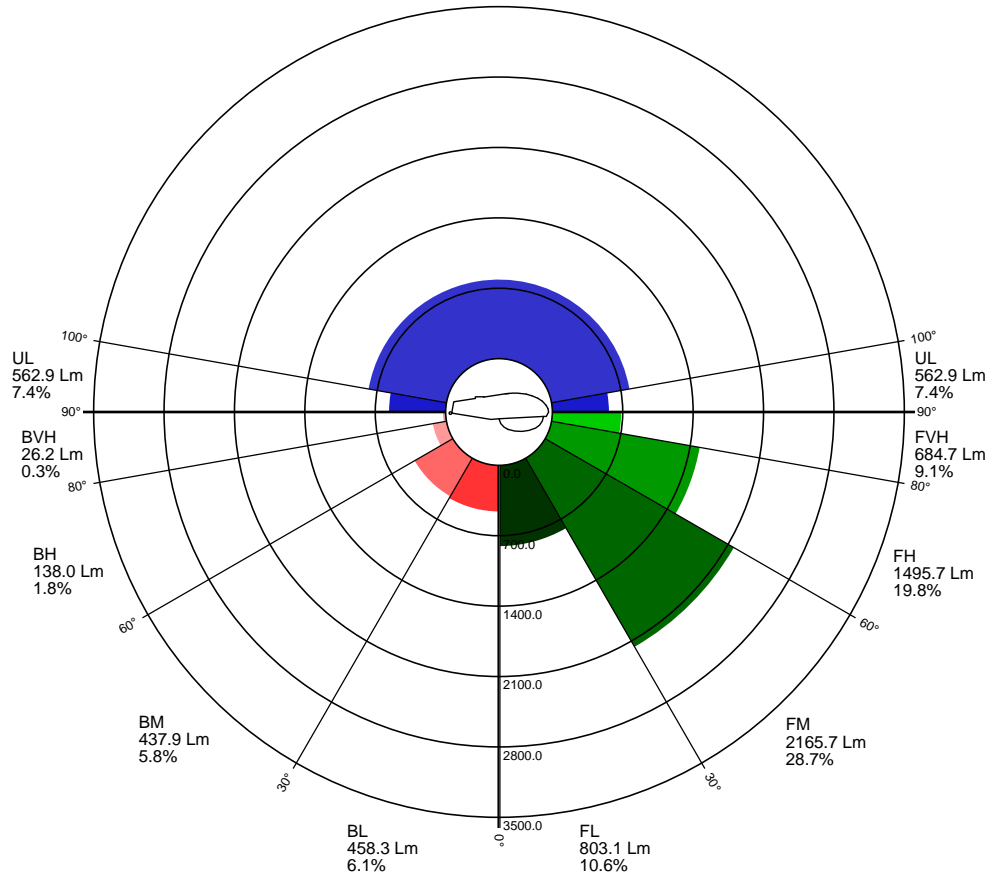
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 03/31/17

BUG Rating:				B1 U4 G4		
Zonal Summary				Zone Ratings		
				B	U	G
Forward						
FL	(0° - 30°)	803.1	10.6			
FM	(30° - 60°)	2165.7	28.7			
FH	(60° - 80°)	1495.7	19.8			G1
FVH	(80° - 90°)	684.7	9.1			G4
Backward						
BL	(0° - 30°)	458.3	6.1	B1		
BM	(30° - 60°)	437.9	5.8	B1		
BH	(60° - 80°)	138.0	1.8	B1		G1
BVH	(80° - 90°)	26.2	0.3			G1
Upward						
UL	(90° - 100°)	562.9	7.4		U4	
UH	(100° - 180°)	786.3	10.4		U4	
Trapped Light						
Total Flux						
		7559	100.0			

Zonal Lumen Summary

(Linear scale)

UH
786.3 Lm
10.4%

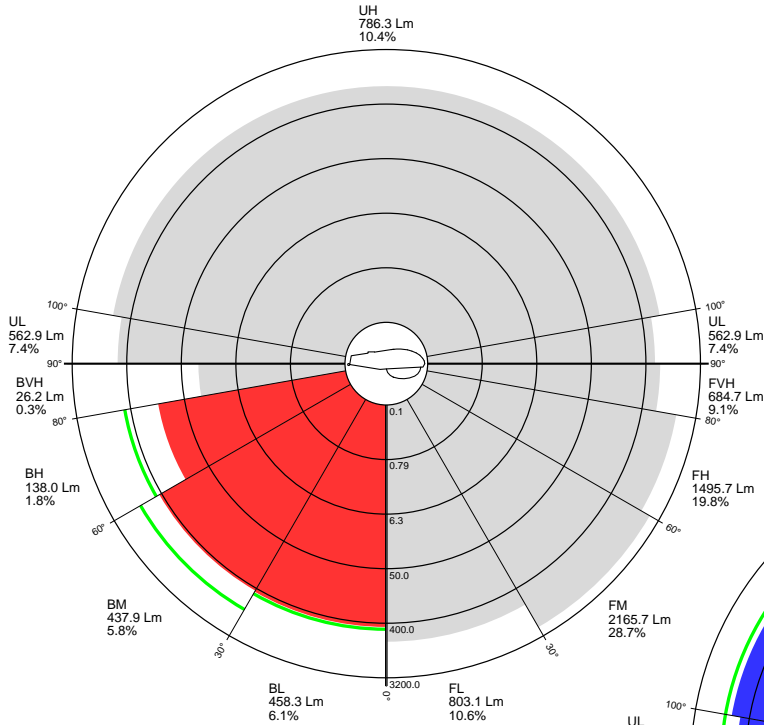


REPORT NUMBER: RAB03137
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PREPARED FOR: RAB LIGHTING INC.

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DATE SAMPLE TESTED: 03/31/17

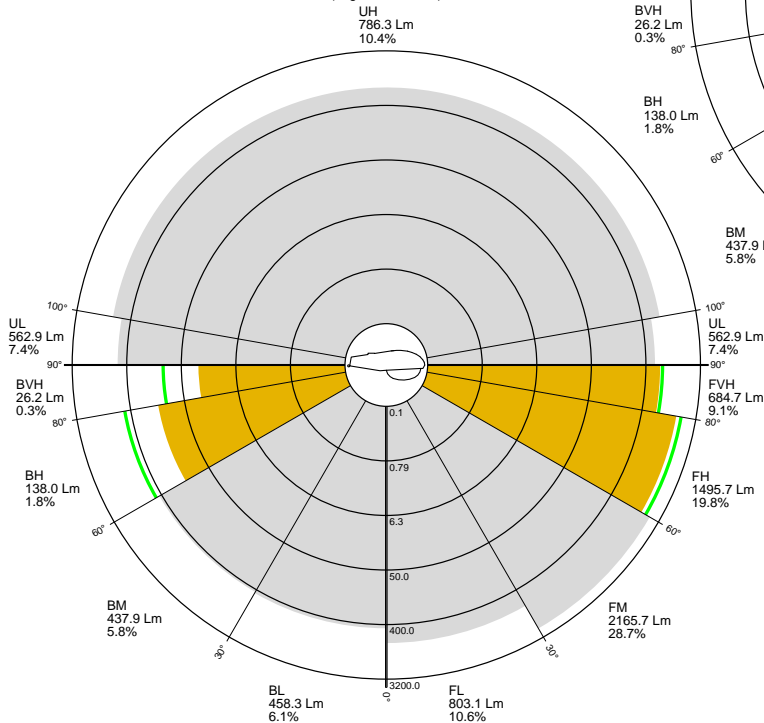
Backlight Rating Details

(Logarithmic scale)



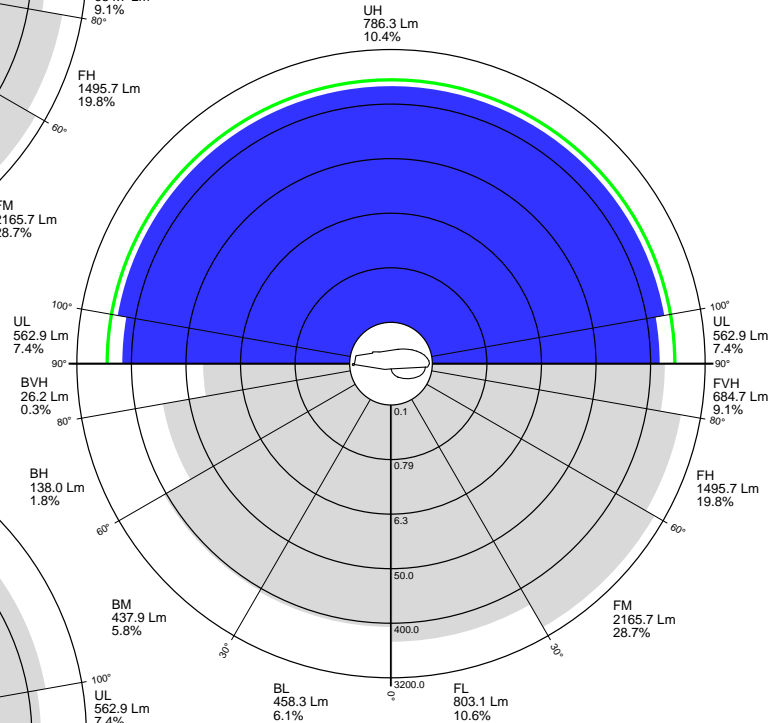
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB03137
 ISSUE DATE: 03/31/17
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9
 DATE SAMPLE TESTED: 03/31/17

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	4.	4.	4.	4.	4.	4.	4.	4.	4.
	175.0	1.	1.	2.	3.	4.	5.	6.	6.	7.
	165.0	22.	23.	21.	20.	17.	13.	8.	6.	7.
	155.0	64.	65.	62.	58.	52.	44.	32.	20.	8.
	145.0	150.	149.	142.	128.	112.	92.	68.	52.	26.
	135.0	211.	212.	196.	170.	131.	103.	97.	81.	51.
	125.0	382.	388.	357.	323.	256.	188.	111.	71.	68.
	115.0	850.	857.	775.	656.	496.	354.	215.	111.	76.
	105.0	1348.	1384.	1327.	1188.	910.	654.	415.	235.	103.
	95.0	1874.	1913.	1830.	1608.	1351.	994.	671.	439.	243.
	90.0	1925.	1996.	2013.	1830.	1528.	1168.	805.	545.	376.
	87.5	2079.	2112.	1969.	1803.	1576.	1191.	834.	600.	442.
	85.0	2108.	2181.	2126.	2004.	1668.	1268.	870.	626.	527.
V	82.5	2225.	2262.	2194.	1976.	1664.	1274.	905.	689.	599.
E	80.0	2225.	2315.	2186.	1957.	1698.	1288.	943.	752.	678.
R	77.5	2376.	2419.	2385.	2118.	1660.	1294.	962.	817.	787.
T	75.0	2104.	2154.	2040.	1861.	1666.	1318.	997.	874.	896.
I	72.5	2571.	2651.	2459.	2079.	1605.	1287.	1056.	970.	939.
C	70.0	1992.	2013.	1986.	1857.	1684.	1345.	1103.	1255.	1000.
A	67.5	2216.	2262.	2103.	1838.	1535.	1334.	1195.	1320.	1052.
L	65.0	2232.	2263.	2157.	1913.	1614.	1393.	1504.	1369.	1081.
	62.5	1985.	2006.	1897.	1711.	1585.	1559.	1655.	1442.	1069.
A	60.0	1915.	1936.	1838.	1716.	1625.	1755.	1767.	1521.	1025.
N	57.5	1953.	1962.	1900.	1856.	1937.	2037.	1854.	1577.	1005.
G	55.0	1957.	1991.	1992.	2080.	2059.	2079.	1910.	1549.	1025.
L	52.5	2183.	2158.	2118.	2153.	2277.	2184.	1967.	1581.	1056.
E	50.0	2302.	2303.	2388.	2410.	2326.	2219.	2007.	1451.	1115.
	47.5	2569.	2531.	2574.	2491.	2355.	2238.	2008.	1387.	1175.
	45.0	2700.	2628.	2552.	2488.	2421.	2299.	1933.	1392.	1244.
	42.5	2603.	2567.	2582.	2509.	2451.	2261.	1809.	1423.	1313.
	40.0	2622.	2547.	2520.	2551.	2447.	2204.	1724.	1495.	1387.
	37.5<<	2702.	2654.	2598.	2557.	2387.	2062.	1622.	1582.	1456.
	35.0	2563.	2523.	2675.	2500.	2317.	1941.	1637.	1629.	1520.
	30.0	2384.	2352.	2401.	2229.	1989.	1813.	1760.	1709.	1660.
	25.0	2026.	2007.	1984.	1961.	1909.	1985.	2002.	1885.	1698.
	20.0	1973.	1966.	1970.	2171.	1917.	2142.	2044.	1782.	1700.
	15.0	2149.	2214.	2241.	2081.	1788.	2261.	1734.	1936.	1814.
	10.0	2149.	2050.	1964.	1732.	1793.	2153.	1905.	1810.	1867.
	5.0	1782.	1789.	1790.	1804.	1820.	1885.	1890.	1822.	1728.
	0.0	1706.	1706.	1706.	1706.	1706.	1706.	1706.	1706.	1706.

||
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03137
 ISSUE DATE: 03/31/17
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 03/31/17

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	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
175.0	7.	7.	7.	6.	6.	5.	4.	3.	2.	1.	1.
165.0	7.	7.	7.	7.	6.	6.	5.	3.	3.	2.	2.
155.0	8.	8.	7.	7.	7.	6.	5.	4.	3.	3.	3.
145.0	10.	8.	8.	8.	7.	6.	5.	4.	4.	3.	3.
135.0	17.	13.	11.	11.	9.	7.	5.	4.	4.	4.	4.
125.0	33.	26.	18.	17.	13.	9.	6.	4.	4.	4.	4.
115.0	53.	44.	33.	25.	19.	13.	8.	5.	5.	5.	5.
105.0	57.	48.	43.	37.	25.	16.	11.	8.	8.	8.	8.
95.0	48.	53.	53.	49.	34.	21.	14.	10.	10.	10.	10.
90.0	59.	53.	64.	59.	41.	25.	17.	11.	10.	10.	10.
87.5	78.	62.	72.	65.	46.	29.	19.	12.	10.	10.	10.
85.0	111.	79.	79.	74.	55.	36.	24.	12.	10.	10.	10.
V 82.5	156.	102.	88.	86.	64.	50.	39.	29.	29.	29.	30.
E 80.0	219.	131.	98.	97.	72.	70.	52.	48.	42.	45.	47.
R 77.5	284.	169.	108.	106.	81.	86.	64.	66.	57.	55.	56.
T 75.0	346.	214.	119.	112.	89.	96.	79.	76.	77.	69.	69.
I 72.5	404.	263.	134.	115.	95.	99.	97.	82.	95.	91.	91.
C 70.0	440.	306.	153.	118.	101.	102.	117.	90.	101.	112.	113.
A 67.5	474.	356.	178.	124.	108.	105.	129.	102.	101.	117.	120.
L 65.0	498.	397.	212.	134.	119.	109.	129.	122.	103.	110.	110.
62.5	538.	442.	249.	152.	131.	119.	127.	142.	115.	104.	103.
A 60.0	588.	484.	292.	178.	147.	129.	130.	147.	140.	122.	120.
N 57.5	624.	536.	342.	210.	164.	146.	142.	146.	163.	151.	149.
G 55.0	684.	590.	392.	248.	186.	166.	154.	151.	159.	177.	178.
L 52.5	748.	637.	445.	288.	215.	187.	172.	164.	161.	165.	166.
E 50.0	809.	709.	502.	328.	245.	208.	194.	179.	176.	166.	166.
47.5	889.	783.	567.	375.	279.	234.	215.	202.	192.	185.	186.
45.0	961.	851.	635.	437.	316.	262.	237.	226.	217.	210.	212.
42.5	1041.	928.	709.	504.	357.	292.	260.	247.	236.	230.	229.
40.0	1122.	1008.	781.	577.	411.	326.	284.	265.	252.	244.	244.
37.5<<	1196.	1089.	860.	660.	482.	366.	314.	286.	272.	262.	262.
35.0	1269.	1168.	935.	748.	576.	425.	352.	316.	294.	284.	284.
30.0	1410.	1306.	1096.	924.	780.	631.	496.	410.	375.	357.	358.
25.0	1527.	1427.	1249.	1088.	955.	849.	755.	651.	576.	529.	532.
20.0	1622.	1528.	1393.	1266.	1132.	1030.	959.	886.	846.	829.	831.
15.0	1677.	1636.	1514.	1412.	1307.	1219.	1156.	1098.	1064.	1033.	1038.
10.0	1703.	1692.	1607.	1535.	1475.	1449.	1333.	1297.	1299.	1300.	1306.
5.0	1688.	1681.	1671.	1647.	1608.	1554.	1538.	1535.	1534.	1523.	1525.
0.0	1706.	1706.	1706.	1706.	1706.	1706.	1706.	1706.	1706.	1706.	1706.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03137
 ISSUE DATE: 03/31/17
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
 DATE SAMPLE TESTED: 03/31/17

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	41
5- 10	122
10- 15	194
15- 20	259
20- 25	302
25- 30	343
30- 35	383
35- 40	422
40- 45	449
45- 50	465
50- 55	453
55- 60	430
60- 65	414
65- 70	411
70- 75	411
75- 80	397
80- 85	373
85- 90	338
90- 95	302
95-100	261
100-105	215
105-110	168
110-115	126
115-120	87
120-125	58
125-130	40
130-135	29
135-140	21
140-145	17
145-150	11
150-155	7
155-160	4
160-165	2
165-170	1
170-175	0
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	163
0- 20	616
0- 30	1261
0- 40	2067
0- 50	2981
0- 60	3865
0- 70	4690
0- 80	5499
0- 90	6210
0-100	6772
0-110	7156
0-120	7369
0-130	7467
0-140	7517
0-150	7545
0-160	7555
0-170	7558
0-180	7559

REPORT NUMBER: RAB03138
 DATE: 3/31/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65, WP3LED65/D10 (STANDARD CUTOFF - PRISMATIC GLASS LENS)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: LARGE WALLPACK WITH ALUMINUM PRECISION DIE CAST CONSTRUCTION AND TEMPERED GLASS REFRACTOR.

LAMP: ONE HUNDRED FORTY FOUR WHITE LIGHT EMITTING DIODES (LEDs).

DRIVER: RD-G075-A2800-C

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:
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	N/A
	OCEAN OPTICS QE65PRO Spectroradiometer	3/01/18
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	03/07/18

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Total Radiant Flux*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRI_a,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	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u> Lighting Engineer

REPORT NUMBER: RAB03138
 DATE: 3/31/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65, WP3LED65/D10 (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	7559 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3396
Chromaticity Ordinate y	0.3481
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2091
Chromaticity Ordinate v'	0.4821
Correlated Color Temp CCT (K)	5207
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	24089 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.515
Input Power (Watts)	61.7
Input Power Factor (%)	99.8
Input Current THD (%)	6.5
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	122.5
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.236
Input Power (Watts)	60.8
Input Power Factor (%)	93.0
Input Current THD (%)	9.6
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	80
R2 Dark greyish yellow	85
R3 Strong yellowish green	88
R4 Moderate yellowish green	83
R5 Light bluish green	82
R6 Light blue	80
R7 Light violet	86
R8 Light reddish purple	69
R9 Strong red	11
R10 Strong yellow	65
R11 Strong green	83
R12 Strong blue	64
R13 Light yellowish pink (skin)	81
R14 Moderate olive green (leaf)	94

*NOTE:

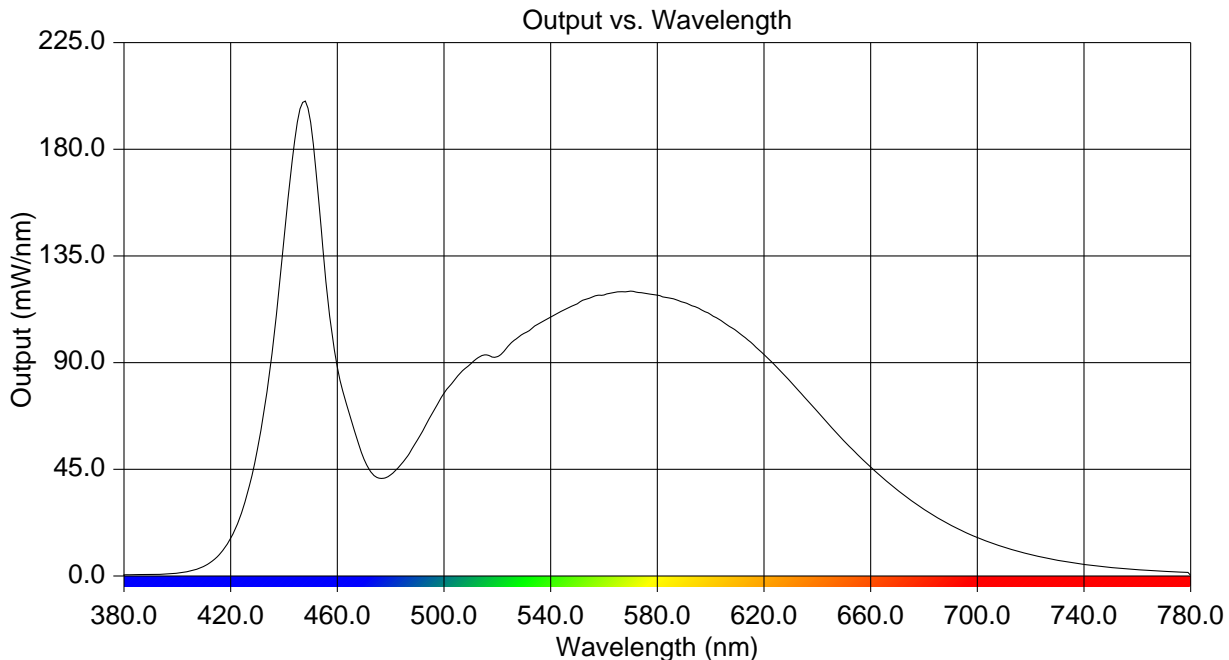
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB03138
 DATE: 3/31/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65, WP3LED65/D10 (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.482	515	93.230	650	56.989
385	0.568	520	92.527	655	51.298
390	0.623	525	98.092	660	45.934
395	0.805	530	102.356	665	40.979
400	1.218	535	106.188	670	36.306
405	2.145	540	109.123	675	32.010
410	4.118	545	112.210	680	28.123
415	8.129	550	114.824	685	24.638
420	15.784	555	117.478	690	21.460
425	29.963	560	118.544	695	18.679
430	53.262	565	119.924	700	16.262
435	89.643	570	120.183	705	14.060
440	141.473	575	119.363	710	12.176
445	191.467	580	118.479	715	10.472
450	191.387	585	117.245	720	8.991
455	132.884	590	115.406	725	7.754
460	88.069	595	113.329	730	6.648
465	66.587	600	110.331	735	5.714
470	49.290	605	106.911	740	4.897
475	41.527	610	103.111	745	4.200
480	42.685	615	98.670	750	3.610
485	48.563	620	93.376	755	3.105
490	57.317	625	88.066	760	2.668
495	67.454	630	81.824	765	2.262
500	77.097	635	75.647	770	1.970
505	84.206	640	69.445	775	1.692
510	89.470	645	63.072	780	0.256



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CIE Chromaticity Diagram

