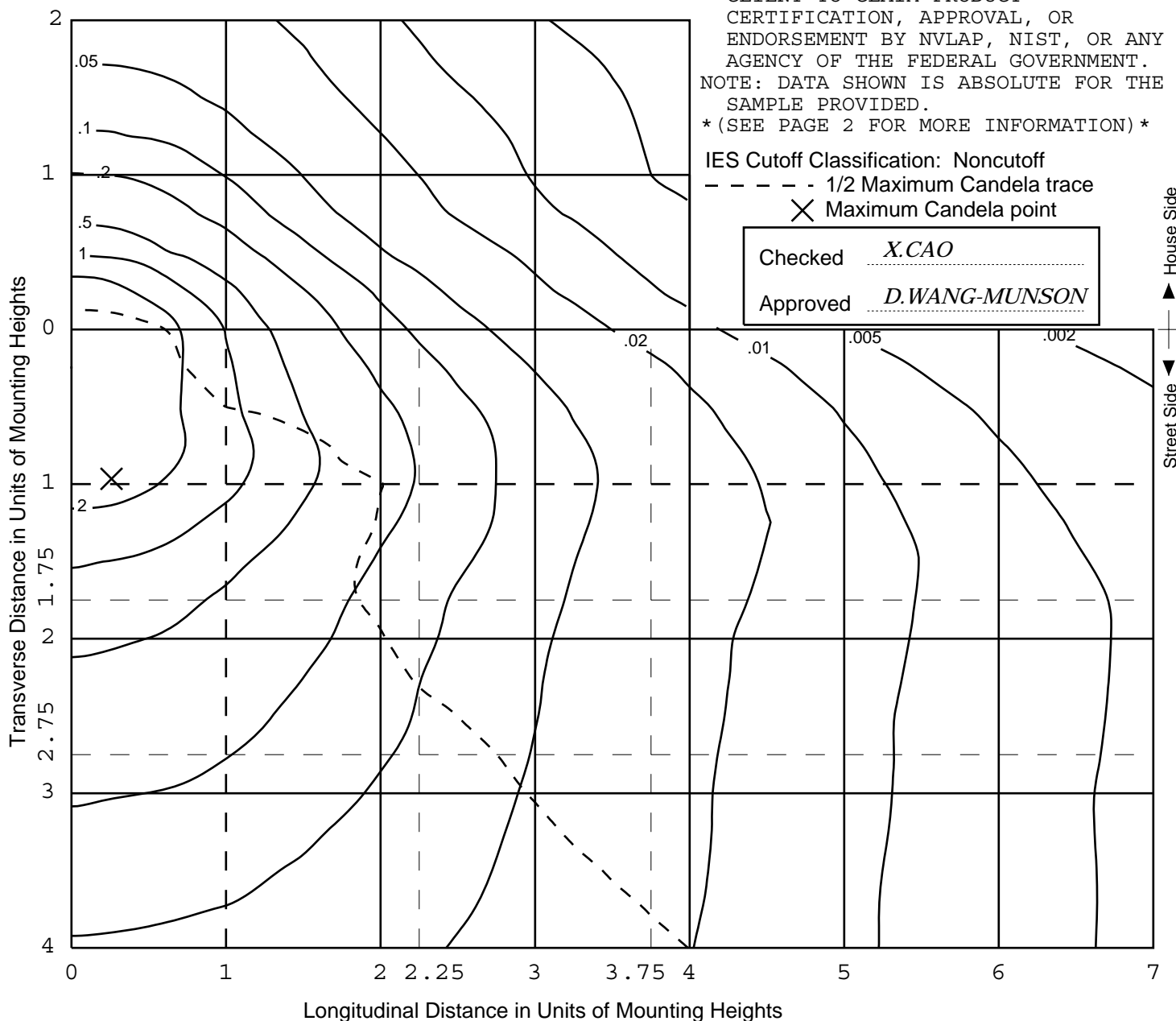


- - - - - 1/2 Maximum Candela trace  
 X Maximum Candela point

Checked X.CAO  
Approved D.WANG-MUNSON



REPORT NUMBER: RAB03127  
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PREPARED FOR: RAB LIGHTING INC.

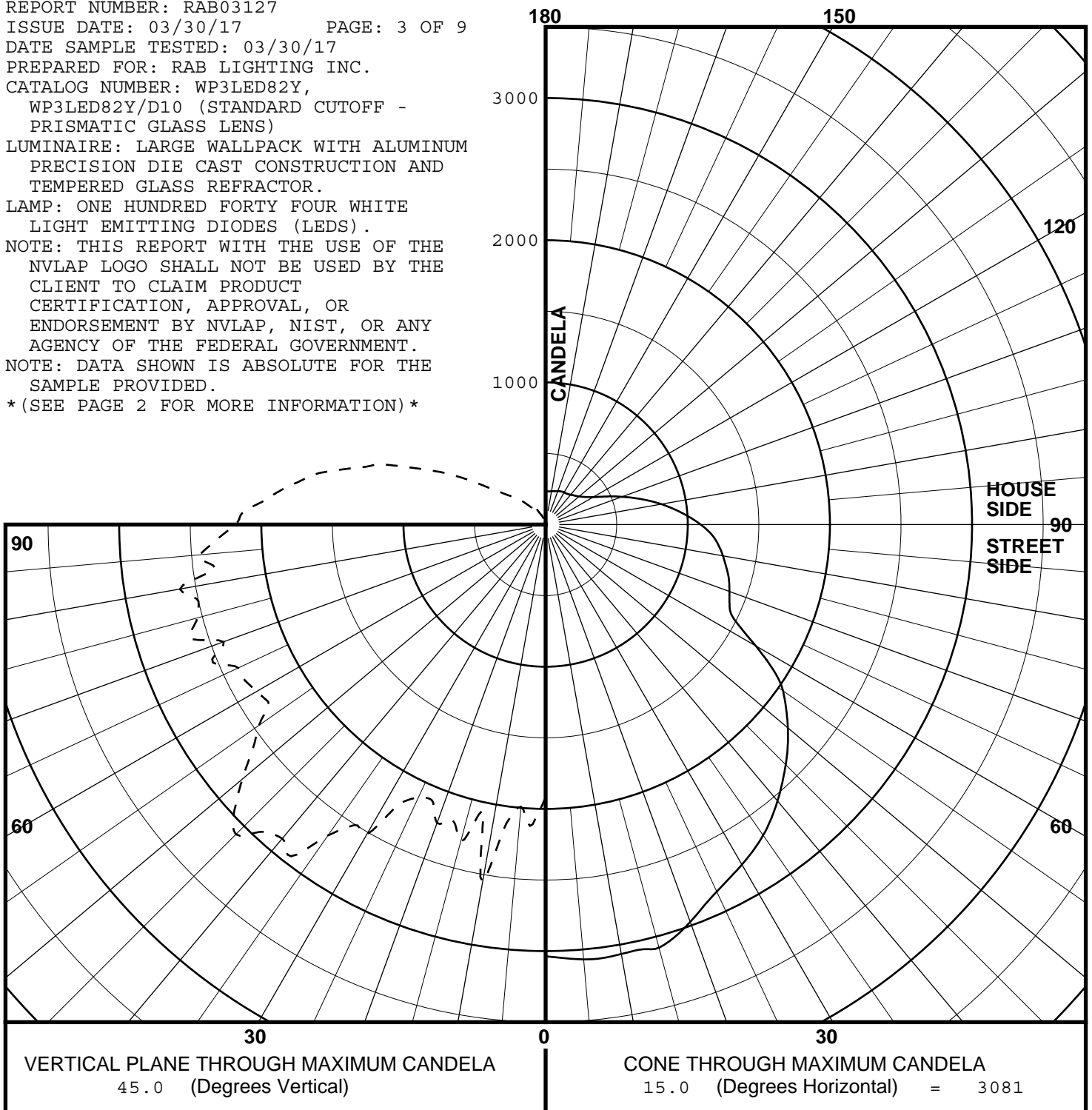
PAGE: 2 OF 9  
DATE SAMPLE TESTED: 03/30/17

ADDITIONAL INFORMATION

TOTAL INPUT WATTS = 82.974 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: 24.9  
ACCREDITED LABORATORY CODE 201058-0

## MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

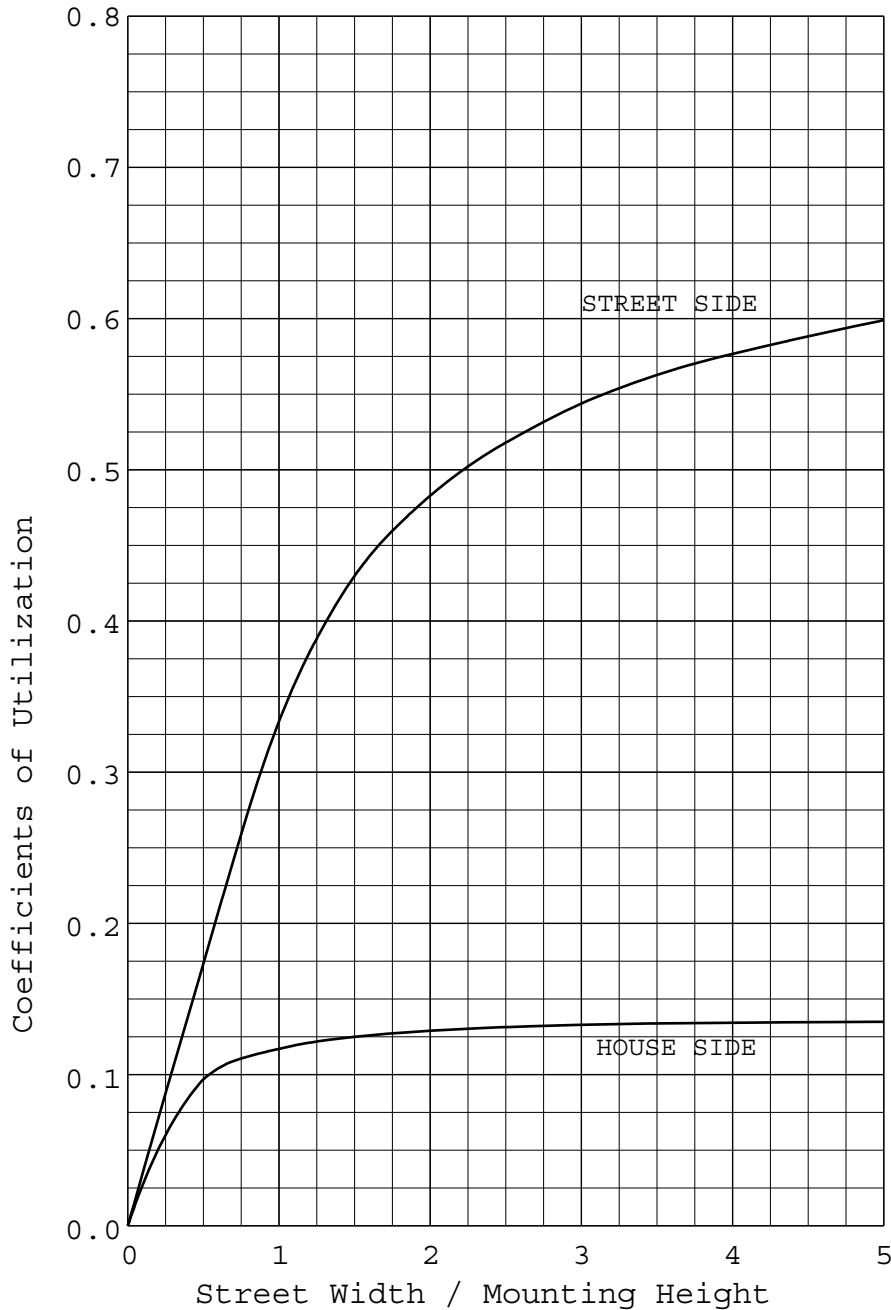
REPORT NUMBER: RAB03127  
 ISSUE DATE: 03/30/17      PAGE: 3 OF 9  
 DATE SAMPLE TESTED: 03/30/17  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: WP3LED82Y,  
 WP3LED82Y/D10 (STANDARD CUTOFF -  
 PRISMATIC GLASS LENS)  
 LUMINAIRE: LARGE WALLPACK WITH ALUMINUM  
 PRECISION DIE CAST CONSTRUCTION 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)\*



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PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9  
DATE SAMPLE TESTED: 03/30/17

## COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	5797.	68.2
DOWNWARD HOUSE SIDE	1168.	13.7
DOWNWARD TOTAL	6965.	82.0
UPWARD STREET SIDE	1476.	17.4
UPWARD HOUSE SIDE	57.	0.7
UPWARD TOTAL	1533.	18.0
TOTAL FLUX	8498.	100.0

TOTAL INPUT WATTS = 83.0  
EFFICACY = 102.4 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: RAB03127  
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 PREPARED FOR: RAB LIGHTING INC.

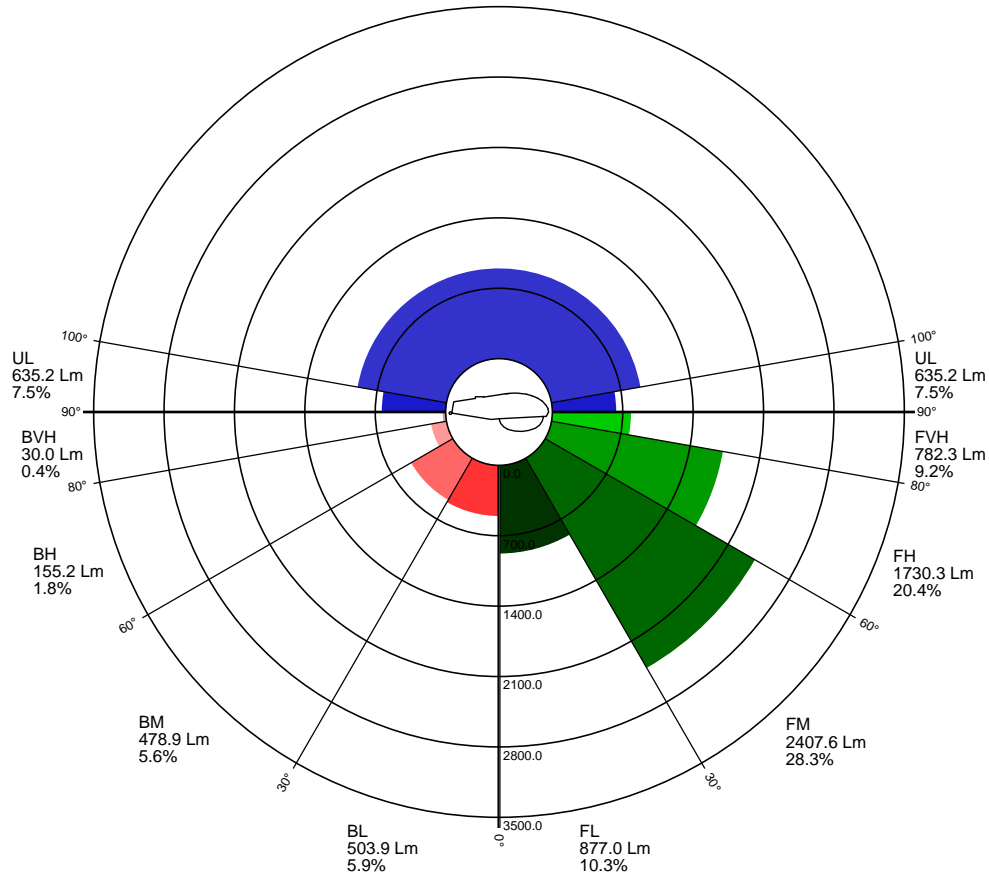
PAGE: 5 OF 9  
 DATE SAMPLE TESTED: 03/30/17

BUG Rating:				B2 U4 G5		
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		5797	68.2			
FL	(0° - 30°)	877.0	10.3			
FM	(30° - 60°)	2407.6	28.3			
FH	(60° - 80°)	1730.3	20.4			G1
FVH	(80° - 90°)	782.3	9.2			G5
Backward		1168	13.7			
BL	(0° - 30°)	503.9	5.9	B2		
BM	(30° - 60°)	478.9	5.6	B1		
BH	(60° - 80°)	155.2	1.8	B1		G1
BVH	(80° - 90°)	30.0	0.4			G1
Upward		1533	18.0			
UL	(90° - 100°)	635.2	7.5		U4	
UH	(100° - 180°)	897.5	10.6		U4	
Trapped Light		0	0.0			
Total Flux		8498	100.0			

### Zonal Lumen Summary

(Linear scale)

UH  
897.5 Lm  
10.6%

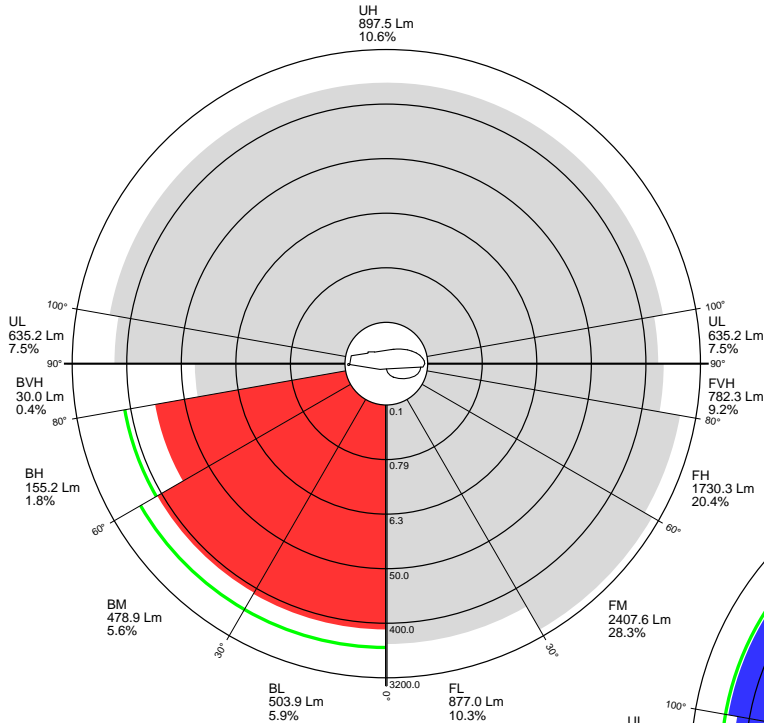


REPORT NUMBER: RAB03127  
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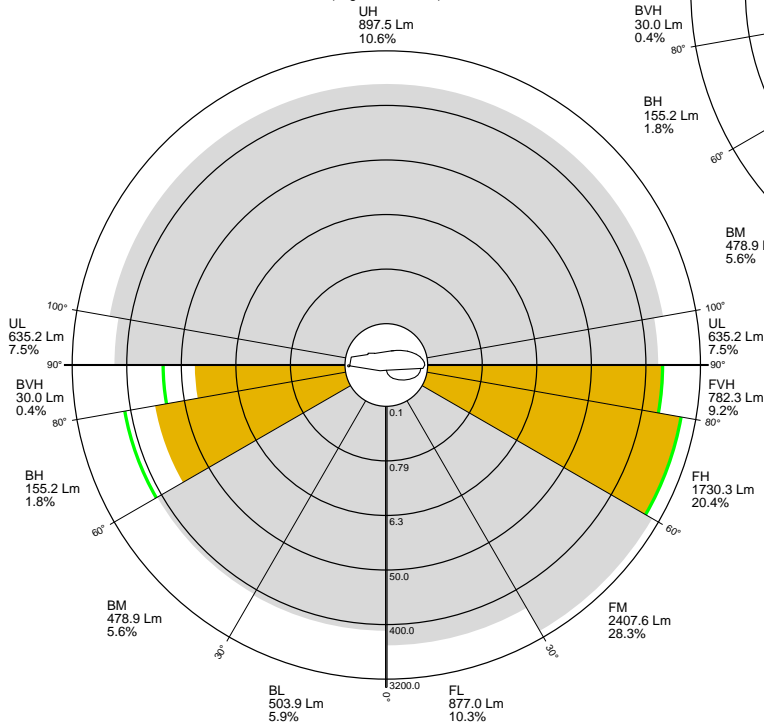
## Backlight Rating Details

(Logarithmic scale)



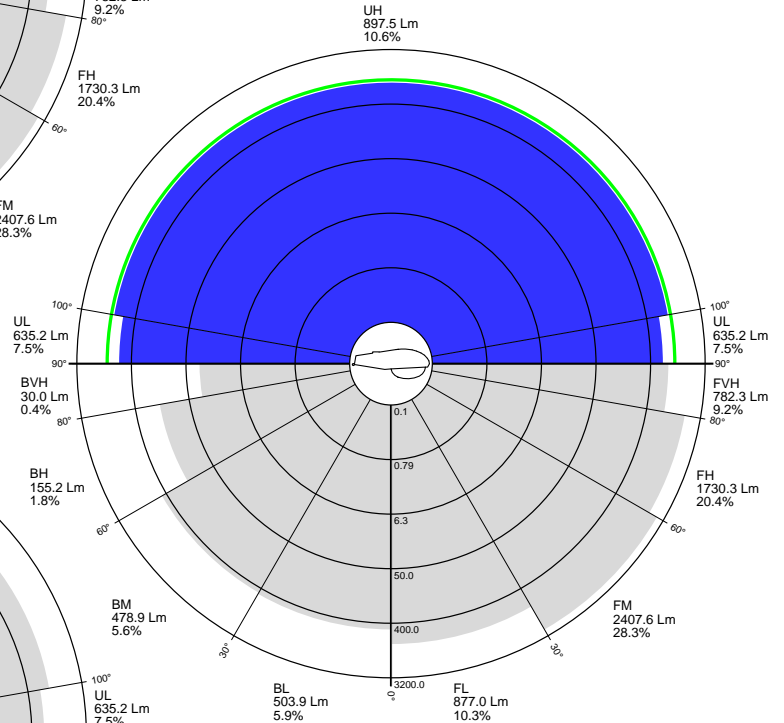
## Glare Rating Details

(Logarithmic scale)



## Uplight Rating Details

(Logarithmic scale)



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 PREPARED FOR: RAB LIGHTING INC.

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 DATE SAMPLE TESTED: 03/30/17

### 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	5.	5.	5.	5.	5.	5.	5.	5.	5.
	175.0	1.	1.	2.	3.	5.	6.	7.	8.	8.
	165.0	25.	24.	24.	20.	18.	13.	9.	7.	8.
	155.0	78.	77.	76.	69.	61.	50.	34.	20.	10.
	145.0	185.	184.	180.	166.	148.	114.	84.	57.	26.
	135.0	254.	249.	233.	197.	156.	123.	114.	95.	57.
	125.0	439.	424.	405.	368.	297.	215.	136.	87.	81.
	115.0	988.	966.	904.	755.	567.	396.	247.	128.	90.
	105.0	1594.	1542.	1493.	1316.	1035.	734.	480.	266.	114.
	95.0	2075.	2023.	1980.	1814.	1531.	1148.	788.	504.	281.
	90.0	2278.	2212.	2183.	2016.	1726.	1337.	905.	628.	423.
	87.5	2387.	2341.	2309.	2134.	1846.	1411.	969.	666.	505.
	85.0	2579.	2539.	2445.	2162.	1912.	1467.	1018.	738.	581.
V	82.5	2413.	2354.	2348.	2359.	1979.	1489.	1057.	786.	672.
E	80.0	2743.	2724.	2612.	2266.	1938.	1538.	1086.	851.	766.
R	77.5	2603.	2510.	2501.	2490.	2041.	1497.	1106.	910.	909.
T	75.0	2653.	2635.	2537.	2183.	1851.	1556.	1150.	985.	963.
I	72.5	2761.	2671.	2628.	2441.	1999.	1502.	1207.	1203.	1033.
C	70.0	2587.	2526.	2411.	2165.	1876.	1574.	1284.	1351.	1095.
A	67.5	2614.	2580.	2535.	2268.	1927.	1587.	1475.	1474.	1120.
L	65.0	2563.	2471.	2386.	2158.	1879.	1705.	1716.	1567.	1133.
	62.5	2478.	2436.	2381.	2131.	1923.	1899.	1857.	1531.	1064.
A	60.0	2483.	2434.	2348.	2178.	2107.	2077.	2081.	1647.	1033.
N	57.5	2405.	2361.	2315.	2290.	2200.	2371.	2027.	1659.	1039.
G	55.0	2518.	2465.	2462.	2380.	2435.	2400.	2075.	1608.	1083.
L	52.5	2561.	2540.	2598.	2598.	2639.	2443.	2195.	1603.	1120.
E	50.0	2701.	2712.	2786.	2884.	2741.	2498.	2105.	1470.	1182.
	47.5	3050.	3071.	2968.	2916.	2664.	2440.	2078.	1419.	1258.
	45.0<<	3036.	3070.	3081.	2848.	2668.	2389.	2039.	1431.	1327.
	42.5	2903.	2927.	2931.	2919.	2677.	2397.	1863.	1484.	1380.
	40.0	2978.	3025.	2882.	2784.	2495.	2235.	1768.	1545.	1438.
	37.5	2840.	2904.	2941.	2612.	2456.	2156.	1691.	1671.	1504.
	35.0	2692.	2723.	2669.	2637.	2419.	1987.	1787.	1835.	1607.
	30.0	2436.	2501.	2514.	2268.	2083.	1897.	1895.	1762.	1896.
	25.0	2168.	2169.	2119.	2132.	2019.	2058.	2161.	2227.	2028.
	20.0	2120.	2116.	2234.	2200.	2142.	2298.	1979.	1851.	1884.
	15.0	2169.	2218.	2306.	2437.	2066.	2342.	1976.	2359.	1947.
	10.0	2551.	2569.	2551.	2221.	1957.	2197.	2302.	1959.	2128.
	5.0	2047.	2005.	1992.	1944.	1955.	2033.	2103.	2079.	1962.
	0.0	1919.	1919.	1919.	1919.	1919.	1919.	1919.	1919.	1919.

||  
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03127  
 ISSUE DATE: 03/30/17  
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9  
 DATE SAMPLE TESTED: 03/30/17

### 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	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
175.0	8.	8.	8.	7.	7.	6.	5.	4.	3.	2.	2.
165.0	8.	8.	8.	8.	7.	6.	5.	4.	3.	3.	3.
155.0	9.	9.	8.	8.	8.	7.	6.	5.	4.	4.	4.
145.0	11.	10.	9.	9.	9.	7.	6.	5.	4.	4.	4.
135.0	19.	15.	14.	13.	11.	8.	6.	5.	5.	4.	5.
125.0	38.	29.	21.	20.	16.	11.	7.	5.	5.	5.	5.
115.0	57.	49.	37.	30.	22.	15.	9.	7.	7.	7.	7.
105.0	62.	54.	49.	41.	28.	19.	13.	10.	10.	10.	10.
95.0	53.	61.	63.	58.	39.	24.	17.	13.	12.	12.	12.
90.0	58.	58.	75.	68.	46.	29.	19.	14.	12.	12.	12.
87.5	77.	64.	83.	76.	53.	33.	22.	15.	12.	13.	12.
85.0	111.	78.	92.	87.	64.	43.	28.	16.	12.	12.	12.
V 82.5	163.	101.	102.	100.	74.	63.	45.	40.	35.	39.	40.
E 80.0	223.	130.	112.	113.	85.	83.	59.	61.	50.	53.	54.
R 77.5	293.	170.	122.	124.	96.	100.	74.	76.	69.	65.	67.
T 75.0	362.	215.	130.	130.	105.	111.	94.	86.	91.	83.	80.
I 72.5	418.	264.	140.	134.	114.	116.	115.	97.	109.	107.	106.
C 70.0	472.	315.	155.	139.	120.	120.	134.	109.	118.	131.	131.
A 67.5	503.	364.	180.	147.	129.	124.	145.	128.	122.	138.	139.
L 65.0	542.	419.	216.	158.	143.	130.	146.	148.	129.	136.	136.
62.5	586.	469.	258.	173.	160.	142.	148.	159.	145.	135.	133.
A 60.0	641.	521.	303.	191.	177.	158.	155.	160.	165.	155.	154.
N 57.5	697.	574.	354.	220.	196.	177.	166.	160.	168.	180.	180.
G 55.0	766.	632.	408.	259.	215.	200.	182.	173.	164.	172.	173.
L 52.5	828.	708.	473.	302.	237.	220.	199.	192.	176.	164.	160.
E 50.0	916.	785.	538.	352.	266.	239.	224.	208.	198.	186.	184.
47.5	1002.	881.	610.	404.	302.	261.	246.	231.	221.	214.	213.
45.0<<	1091.	960.	694.	467.	338.	288.	264.	257.	243.	234.	231.
42.5	1174.	1049.	771.	540.	380.	317.	284.	272.	263.	254.	252.
40.0	1266.	1138.	854.	623.	431.	346.	307.	288.	274.	267.	264.
37.5	1356.	1230.	935.	712.	505.	386.	335.	306.	292.	283.	280.
35.0	1449.	1310.	1034.	807.	604.	443.	374.	334.	309.	303.	300.
30.0	1592.	1457.	1235.	994.	828.	660.	500.	427.	378.	364.	361.
25.0	1691.	1598.	1419.	1192.	1029.	893.	782.	679.	584.	550.	532.
20.0	1795.	1779.	1599.	1399.	1245.	1118.	995.	929.	886.	860.	855.
15.0	1844.	1838.	1691.	1603.	1452.	1370.	1269.	1175.	1155.	1120.	1114.
10.0	1922.	1893.	1887.	1738.	1683.	1604.	1525.	1466.	1444.	1446.	1449.
5.0	1932.	1918.	1894.	1916.	1888.	1809.	1749.	1727.	1723.	1721.	1722.
0.0	1919.	1919.	1919.	1919.	1919.	1919.	1919.	1919.	1919.	1919.	1919.

CONE OF MAXIMUM CANDELA



REPORT NUMBER: RAB03127  
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 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9  
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### 5-DEGREE ZONAL LUMEN SUMMARY

0- 5	46
5- 10	137
10- 15	218
15- 20	282
20- 25	330
25- 30	368
30- 35	409
35- 40	451
40- 45	493
45- 50	521
50- 55	515
55- 60	497
60- 65	483
65- 70	477
70- 75	470
75- 80	455
80- 85	426
85- 90	387
90- 95	342
95-100	293
100-105	243
105-110	190
110-115	142
115-120	100
120-125	67
125-130	46
130-135	34
135-140	25
140-145	20
145-150	15
150-155	8
155-160	5
160-165	2
165-170	1
170-175	0
175-180	0

### 10-DEGREE ZONAL LUMEN SUMMARY

0- 10	183
0- 20	683
0- 30	1381
0- 40	2241
0- 50	3255
0- 60	4267
0- 70	5228
0- 80	6153
0- 90	6965
0-100	7601
0-110	8033
0-120	8276
0-130	8389
0-140	8447
0-150	8481
0-160	8494
0-170	8497
0-180	8498

REPORT NUMBER: RAB03128  
DATE: 3/29/2017  
PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: WP3LED82Y, WP3LED82Y/D10 (STANDARD CUTOFF - PRISMATIC GLASS LENS)

Page 1 of 4

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 (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	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u>
	Lighting Engineer

REPORT NUMBER: RAB03128  
 DATE: 3/29/2017  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: WP3LED82Y, WP3LED82Y/D10 (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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### RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	8498 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4227
Chromaticity Ordinate y	0.3981
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2440
Chromaticity Ordinate v'	0.5169
Correlated Color Temp CCT (K)	3204
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	25873 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.693
Input Power (Watts)	83.0
Input Power Factor (%)	99.8
Input Current THD (%)	5.6
Input Voltage THD (%)	0.3
EFFICACY (Lumens/Watt)	
	102.4
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.305
Input Power (Watts)	81.0
Input Power Factor (%)	95.8
Input Current THD (%)	8.4
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	90
R3 Strong yellowish green	96
R4 Moderate yellowish green	80
R5 Light bluish green	80
R6 Light blue	87
R7 Light violet	83
R8 Light reddish purple	59
R9 Strong red	5
R10 Strong yellow	76
R11 Strong green	78
R12 Strong blue	70
R13 Light yellowish pink (skin)	82
R14 Moderate olive green (leaf)	98

### \*NOTE:

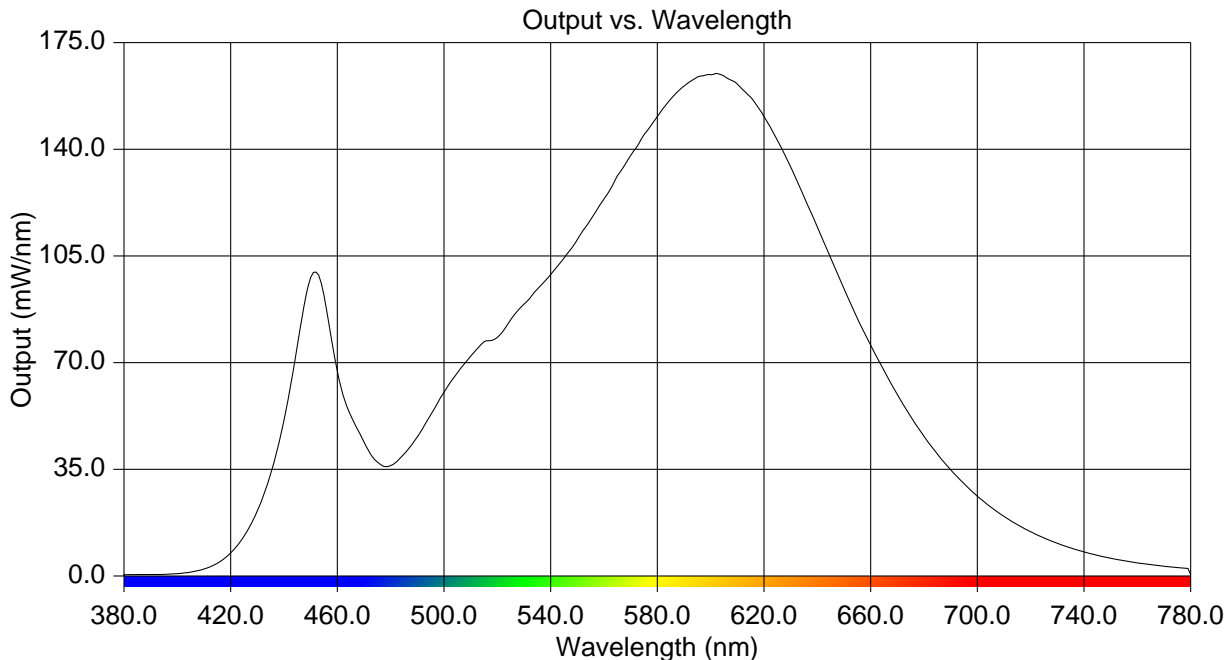
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB03128  
 DATE: 3/29/2017  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: WP3LED82Y, WP3LED82Y/D10 (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.392	515	76.864	650	94.217
385	0.430	520	78.309	655	84.542
390	0.472	525	84.112	660	75.658
395	0.548	530	89.149	665	67.348
400	0.784	535	94.138	670	59.617
405	1.243	540	98.857	675	52.278
410	2.255	545	104.287	680	45.792
415	4.164	550	110.338	685	40.009
420	7.512	555	116.940	690	34.772
425	12.943	560	123.650	695	30.326
430	21.358	565	131.325	700	26.206
435	33.610	570	138.049	705	22.627
440	50.975	575	144.797	710	19.561
445	75.284	580	150.823	715	16.856
450	97.970	585	156.563	720	14.496
455	92.054	590	160.811	725	12.472
460	67.184	595	163.725	730	10.735
465	52.722	600	164.464	735	9.185
470	43.968	605	164.067	740	7.876
475	37.407	610	161.411	745	6.769
480	36.210	615	157.137	750	5.827
485	40.008	620	150.767	755	4.995
490	45.641	625	143.176	760	4.304
495	52.862	630	134.165	765	3.706
500	60.398	635	124.621	770	3.189
505	66.585	640	114.517	775	2.763
510	72.154	645	104.270	780	0.417



REPORT NUMBER: RAB03128  
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## CIE Chromaticity Diagram

