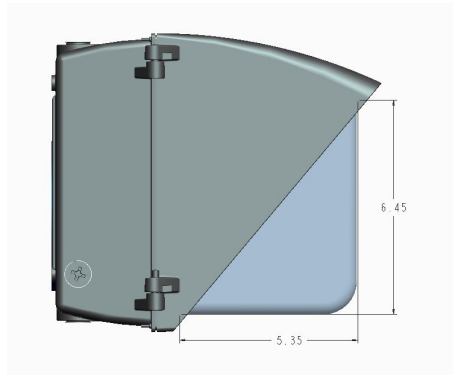


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

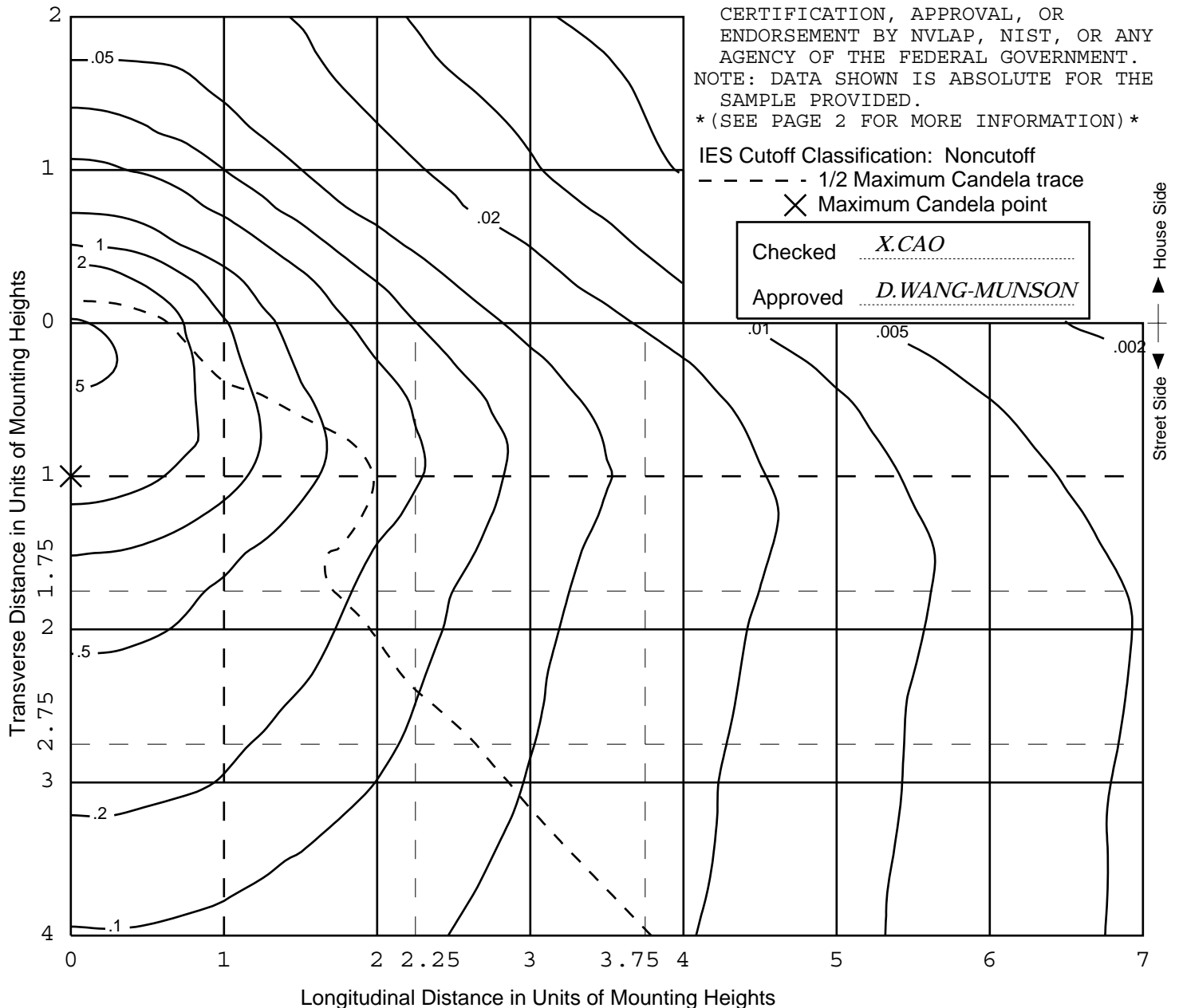
Values based on 20 foot mounting height.



REPORT NUMBER: RAB03139
 ISSUE DATE: 04/03/17 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 04/03/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED82/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)
 LUMINAIRE: COMPACT WALLPACK WITH VANDAL RESISTANT PRISMATIC POLYCARBONATE REFRACTOR.
 LAMP: ONE-HUNDRED AND 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: RAB03139
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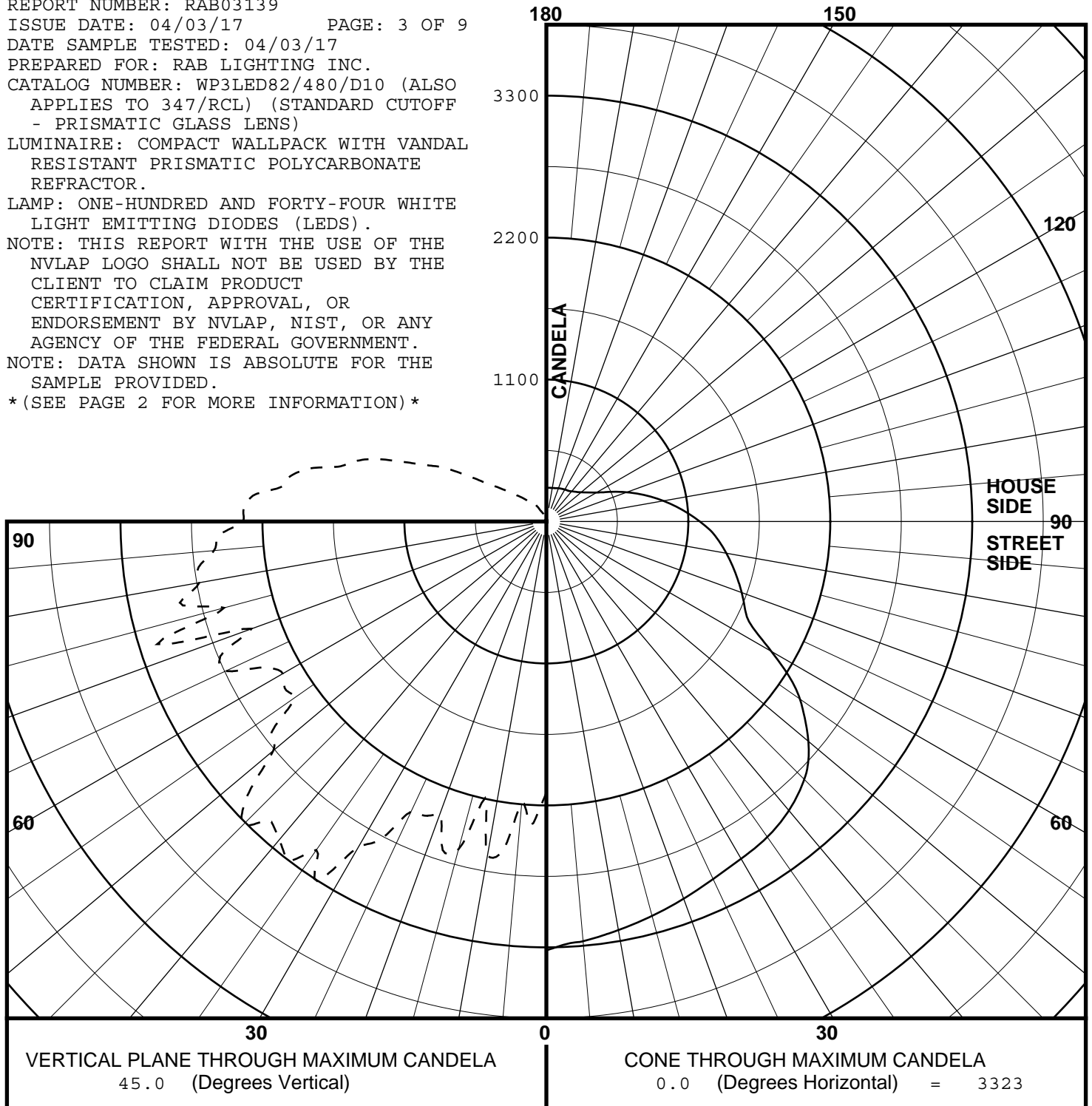
PAGE: 2 OF 9
DATE SAMPLE TESTED: 04/03/17

ADDITIONAL INFORMATION

TOTAL INPUT WATTS = 82.178 W AT 347.0 VAC.
LED DRIVER: RDD-096-A3600-240C
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

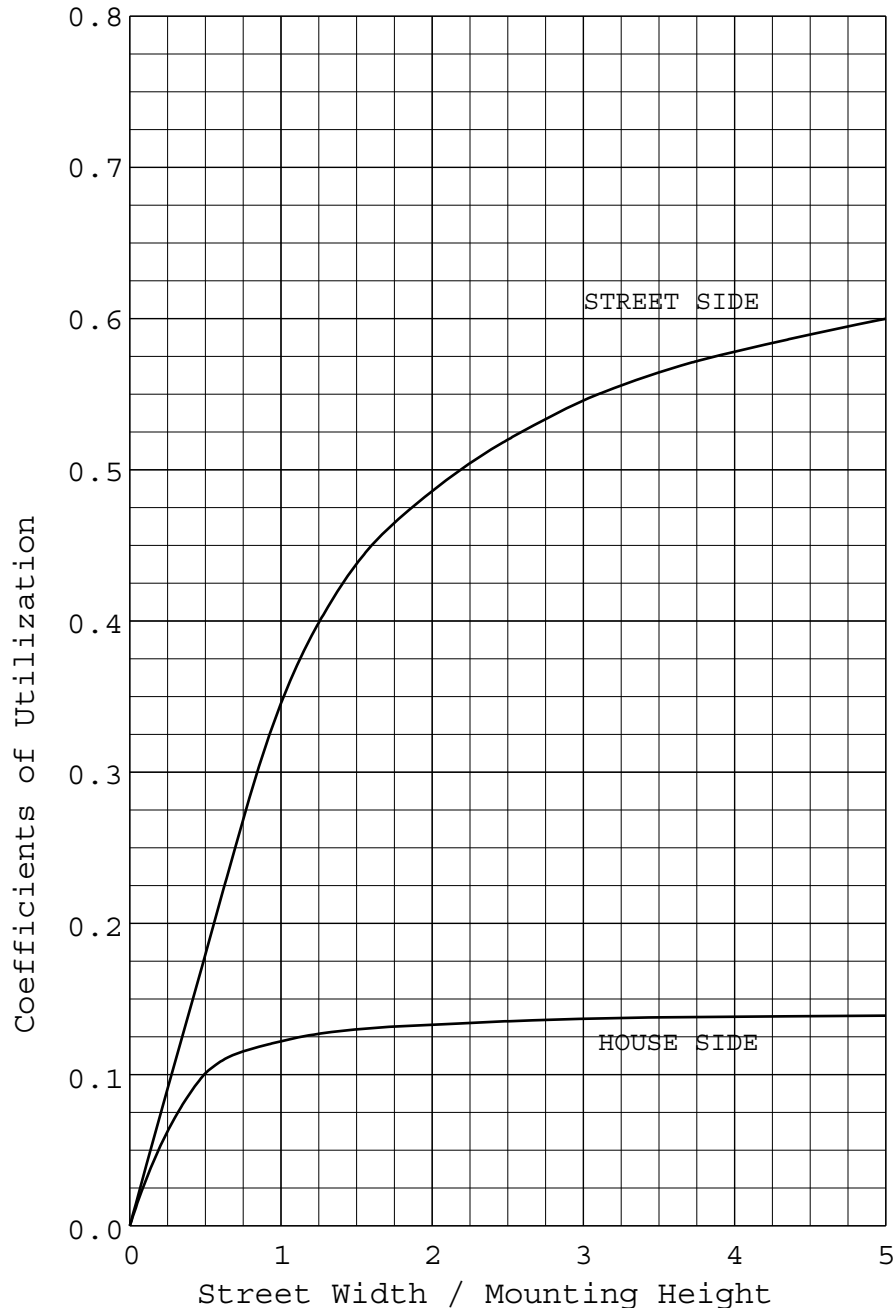
REPORT NUMBER: RAB03139
 ISSUE DATE: 04/03/17 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 04/03/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED82/480/D10 (ALSO
 APPLIES TO 347/RCL) (STANDARD CUTOFF
 - PRISMATIC GLASS LENS)
 LUMINAIRE: COMPACT WALLPACK WITH VANDAL
 RESISTANT PRISMATIC POLYCARBONATE
 REFRACTOR.
 LAMP: ONE-HUNDRED AND 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)



REPORT NUMBER: RAB03139
ISSUE DATE: 04/03/17
PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9
DATE SAMPLE TESTED: 04/03/17

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	6317.	68.1
DOWNWARD HOUSE SIDE	1313.	14.2
DOWNWARD TOTAL	7630.	82.3
UPWARD STREET SIDE	1582.	17.1
UPWARD HOUSE SIDE	60.	0.6
UPWARD TOTAL	1642.	17.7
TOTAL FLUX	9273.	100.0

TOTAL INPUT WATTS = 82.2
EFFICACY = 112.8 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: RAB03139
 ISSUE DATE: 04/03/17
 PREPARED FOR: RAB LIGHTING INC.

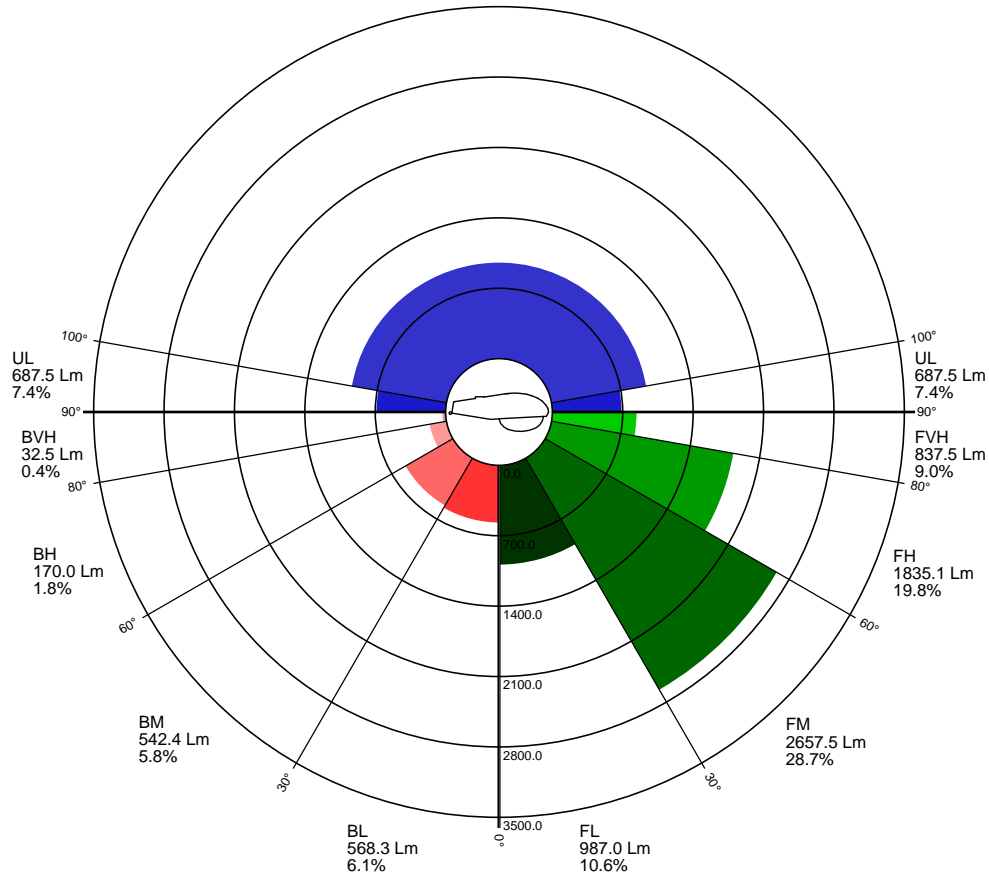
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 04/03/17

BUG Rating:				B2 U4 G5		
Zonal Summary				Zone Ratings		
				B	U	G
Forward						
FL	(0° - 30°)	987.0	10.6			
FM	(30° - 60°)	2657.5	28.7			
FH	(60° - 80°)	1835.1	19.8			G2
FVH	(80° - 90°)	837.5	9.0			G5
Backward						
BL	(0° - 30°)	568.3	6.1	B2		
BM	(30° - 60°)	542.4	5.8	B1		
BH	(60° - 80°)	170.0	1.8	B1		G1
BVH	(80° - 90°)	32.5	0.4			G1
Upward						
UL	(90° - 100°)	687.5	7.4		U4	
UH	(100° - 180°)	954.7	10.3		U4	
Trapped Light						
Total Flux						

Zonal Lumen Summary

(Linear scale)

UH
 954.7 Lm
 10.3%

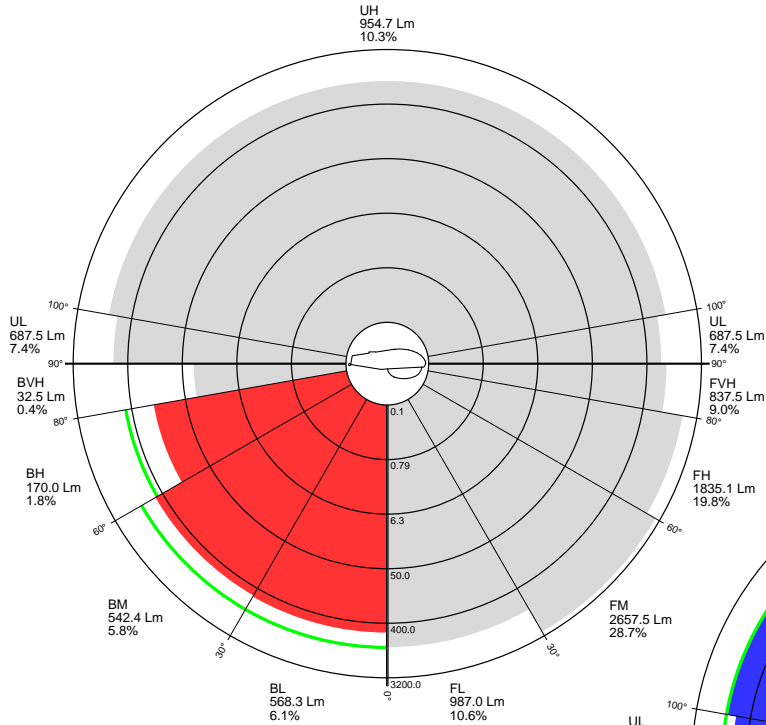


REPORT NUMBER: RAB03139
 ISSUE DATE: 04/03/17
 PREPARED FOR: RAB LIGHTING INC.

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 DATE SAMPLE TESTED: 04/03/17

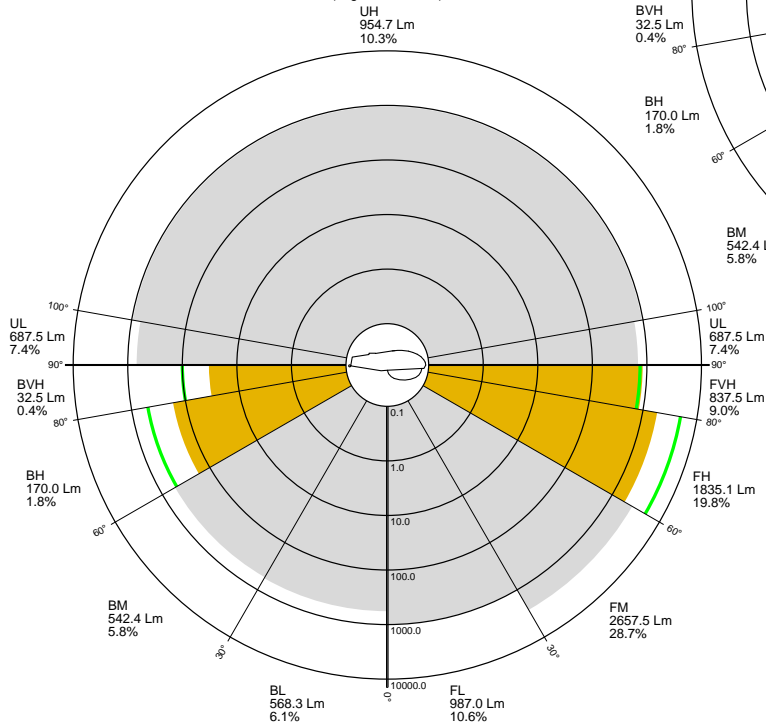
Backlight Rating Details

(Logarithmic scale)



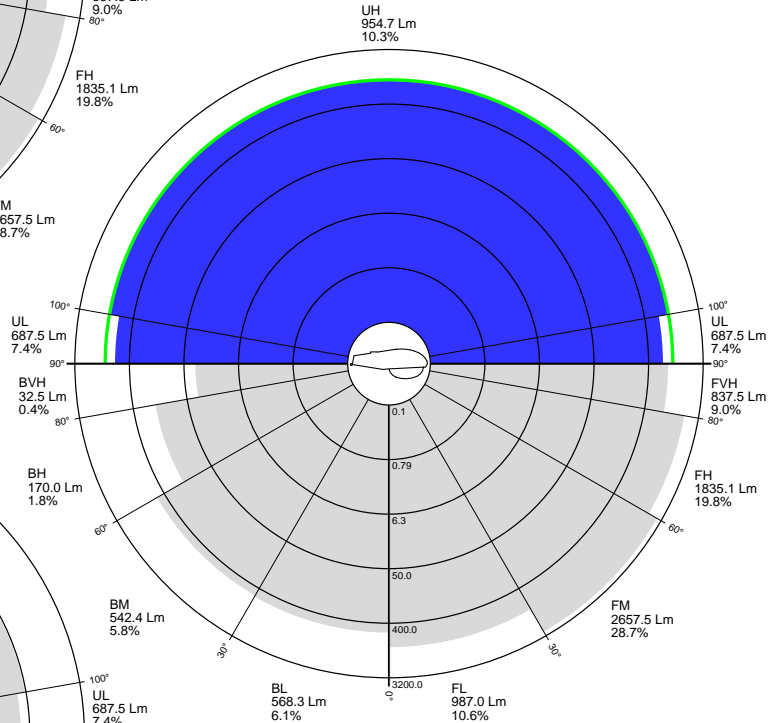
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



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 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9
 DATE SAMPLE TESTED: 04/03/17

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.	4.	5.	6.	7.	8.	8.
	165.0	27.	26.	26.	23.	20.	15.	10.	8.	8.
	155.0	79.	78.	76.	70.	63.	52.	38.	23.	10.
	145.0	183.	182.	173.	155.	136.	109.	82.	62.	32.
	135.0	257.	256.	236.	203.	158.	127.	119.	99.	63.
	125.0	465.	467.	435.	387.	312.	225.	135.	87.	84.
	115.0	1036.	1031.	947.	784.	603.	425.	264.	134.	94.
	105.0	1652.	1669.	1621.	1435.	1114.	791.	505.	285.	126.
	95.0	2285.	2326.	2240.	1946.	1653.	1213.	825.	531.	300.
	90.0	2352.	2406.	2467.	2211.	1882.	1424.	985.	669.	457.
	87.5	2543.	2585.	2413.	2206.	1934.	1461.	1020.	729.	539.
	85.0	2585.	2619.	2609.	2431.	2043.	1554.	1068.	760.	646.
V	82.5	2719.	2799.	2692.	2417.	2035.	1562.	1112.	847.	744.
E	80.0	2732.	2762.	2685.	2402.	2085.	1585.	1155.	914.	845.
R	77.5	2909.	3004.	2924.	2584.	2031.	1588.	1172.	996.	969.
T	75.0	2586.	2615.	2509.	2292.	2055.	1615.	1223.	1064.	1101.
I	72.5	3162.	3209.	3031.	2515.	1974.	1583.	1297.	1177.	1153.
C	70.0	2432.	2482.	2464.	2314.	2071.	1647.	1358.	1539.	1232.
A	67.5	2736.	2747.	2572.	2242.	1888.	1642.	1476.	1634.	1290.
L	65.0	2744.	2795.	2671.	2367.	1980.	1701.	1828.	1632.	1324.
	62.5	2448.	2467.	2345.	2108.	1942.	1884.	2035.	1766.	1322.
A	60.0	2359.	2375.	2259.	2095.	1980.	2145.	2160.	1902.	1246.
N	57.5	2404.	2407.	2321.	2268.	2378.	2492.	2259.	1884.	1225.
G	55.0	2382.	2418.	2419.	2567.	2484.	2516.	2370.	1922.	1246.
L	52.5	2685.	2680.	2586.	2607.	2794.	2705.	2388.	1939.	1281.
E	50.0	2762.	2808.	2899.	2940.	2841.	2715.	2481.	1804.	1356.
	47.5	3141.	3112.	3141.	3059.	2895.	2752.	2453.	1703.	1425.
	45.0<<	3323.	3265.	3164.	3057.	2985.	2827.	2399.	1708.	1514.
	42.5	3154.	3122.	3174.	3089.	3008.	2775.	2257.	1731.	1602.
	40.0	3219.	3149.	3098.	3142.	3003.	2706.	2120.	1823.	1701.
	37.5	3302.	3260.	3218.	3134.	2928.	2521.	1991.	1962.	1805.
	35.0	3108.	3089.	3271.	3058.	2859.	2403.	2006.	2026.	1899.
	30.0	2913.	2884.	2951.	2743.	2449.	2234.	2155.	2042.	2071.
	25.0	2482.	2465.	2432.	2398.	2347.	2461.	2497.	2369.	2086.
	20.0	2419.	2417.	2413.	2628.	2350.	2683.	2487.	2111.	2072.
	15.0	2631.	2674.	2741.	2665.	2185.	2827.	2104.	2435.	2220.
	10.0	2630.	2675.	2484.	2201.	2121.	2637.	2376.	2201.	2310.
	5.0	2187.	2182.	2188.	2196.	2213.	2290.	2328.	2266.	2136.
	0.0	2098.	2098.	2098.	2098.	2098.	2098.	2098.	2098.	2098.

||
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03139
 ISSUE DATE: 04/03/17
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 04/03/17

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.
	175.0	9.	8.	8.	8.	7.	6.	5.	4.	3.	2.
	165.0	9.	9.	8.	8.	8.	7.	6.	4.	3.	3.
	155.0	10.	9.	9.	8.	8.	7.	6.	5.	4.	4.
	145.0	12.	11.	9.	9.	9.	8.	6.	5.	5.	4.
	135.0	23.	19.	13.	14.	12.	8.	6.	5.	5.	4.
	125.0	39.	33.	23.	21.	17.	12.	7.	5.	5.	5.
	115.0	64.	53.	39.	32.	23.	16.	10.	7.	7.	7.
	105.0	69.	59.	50.	45.	31.	21.	14.	10.	10.	10.
	95.0	59.	65.	66.	61.	42.	26.	18.	13.	12.	12.
	90.0	70.	65.	79.	72.	50.	31.	21.	14.	12.	12.
	87.5	96.	74.	88.	81.	57.	36.	23.	15.	12.	13.
	85.0	135.	97.	98.	92.	68.	45.	30.	17.	12.	12.
V	82.5	190.	126.	109.	107.	78.	65.	49.	39.	36.	40.
E	80.0	267.	162.	120.	121.	89.	89.	64.	62.	52.	58.
R	77.5	353.	205.	133.	132.	100.	109.	79.	82.	71.	70.
T	75.0	430.	258.	146.	138.	109.	118.	99.	94.	96.	87.
I	72.5	496.	321.	163.	141.	117.	122.	120.	102.	117.	115.
C	70.0	541.	377.	186.	145.	123.	125.	144.	112.	124.	139.
A	67.5	585.	435.	223.	153.	133.	129.	158.	126.	124.	143.
L	65.0	614.	488.	262.	165.	145.	134.	158.	152.	127.	134.
	62.5	669.	541.	308.	186.	161.	148.	156.	175.	143.	129.
A	60.0	729.	588.	361.	219.	180.	159.	159.	180.	173.	150.
N	57.5	774.	661.	424.	260.	201.	181.	174.	179.	200.	189.
G	55.0	847.	723.	484.	307.	228.	206.	189.	186.	195.	216.
L	52.5	930.	784.	546.	357.	263.	231.	213.	204.	198.	202.
E	50.0	1003.	875.	626.	410.	302.	257.	239.	221.	216.	205.
	47.5	1100.	969.	705.	468.	345.	290.	265.	250.	236.	229.
	45.0<<	1190.	1053.	790.	542.	392.	325.	292.	280.	268.	262.
	42.5	1288.	1147.	881.	627.	443.	363.	322.	305.	291.	283.
	40.0	1386.	1246.	971.	723.	506.	405.	352.	328.	311.	300.
	37.5	1479.	1346.	1066.	824.	599.	457.	389.	355.	338.	324.
	35.0	1573.	1445.	1158.	933.	720.	526.	438.	393.	366.	352.
	30.0	1750.	1610.	1357.	1150.	972.	792.	621.	510.	469.	447.
	25.0	1892.	1753.	1549.	1350.	1183.	1060.	943.	828.	732.	679.
	20.0	1997.	1890.	1721.	1564.	1403.	1285.	1187.	1105.	1054.	1038.
	15.0	2062.	2024.	1870.	1743.	1613.	1514.	1426.	1362.	1313.	1296.
	10.0	2090.	2085.	1992.	1899.	1819.	1798.	1650.	1606.	1595.	1609.
	5.0	2075.	2070.	2056.	2035.	1983.	1917.	1886.	1892.	1891.	1874.
	0.0	2098.	2098.	2098.	2098.	2098.	2098.	2098.	2098.	2098.	2098.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03139
 ISSUE DATE: 04/03/17
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
 DATE SAMPLE TESTED: 04/03/17

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	51
5- 10	150
10- 15	239
15- 20	319
20- 25	373
25- 30	423
30- 35	473
35- 40	520
40- 45	553
45- 50	571
50- 55	556
55- 60	527
60- 65	508
65- 70	505
70- 75	504
75- 80	487
80- 85	457
85- 90	413
90- 95	370
95-100	318
100-105	262
105-110	205
110-115	152
115-120	105
120-125	71
125-130	48
130-135	35
135-140	26
140-145	20
145-150	14
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	201
0- 20	759
0- 30	1555
0- 40	2549
0- 50	3673
0- 60	4755
0- 70	5769
0- 80	6760
0- 90	7630
0-100	8318
0-110	8785
0-120	9042
0-130	9161
0-140	9222
0-150	9256
0-160	9269
0-170	9272
0-180	9273

REPORT NUMBER: RAB03140
DATE: 4/3/2017
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: WP3LED82/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: COMPACT WALLPACK WITH VANDAL RESISTANT PRISMATIC POLYCARBONATE REFRACTOR.

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

DRIVER: RDD-096-A3600-240C

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (347.0 AND 480.0 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	3/01/18
	OCEAN OPTICS QE65PRO Spectroradiometer	03/07/18
	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 (480.0 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: RAB03140
 DATE: 4/3/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED82/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	9273 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3380
Chromaticity Ordinate y	0.3456
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2089
Chromaticity Ordinate v'	0.4806
Correlated Color Temp CCT (K)	5268
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	29754 *
ELECTRICAL	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.240
Input Power (Watts)	82.2
Input Power Factor (%)	98.8
Input Current THD (%)	10.5
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	112.8
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.180
Input Power (Watts)	82.1
Input Power Factor (%)	94.7
Input Current THD (%)	11.8
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	81
R2 Dark greyish yellow	86
R3 Strong yellowish green	88
R4 Moderate yellowish green	83
R5 Light bluish green	82
R6 Light blue	81
R7 Light violet	86
R8 Light reddish purple	70
R9 Strong red	13
R10 Strong yellow	66
R11 Strong green	83
R12 Strong blue	65
R13 Light yellowish pink (skin)	81
R14 Moderate olive green (leaf)	94

*NOTE:

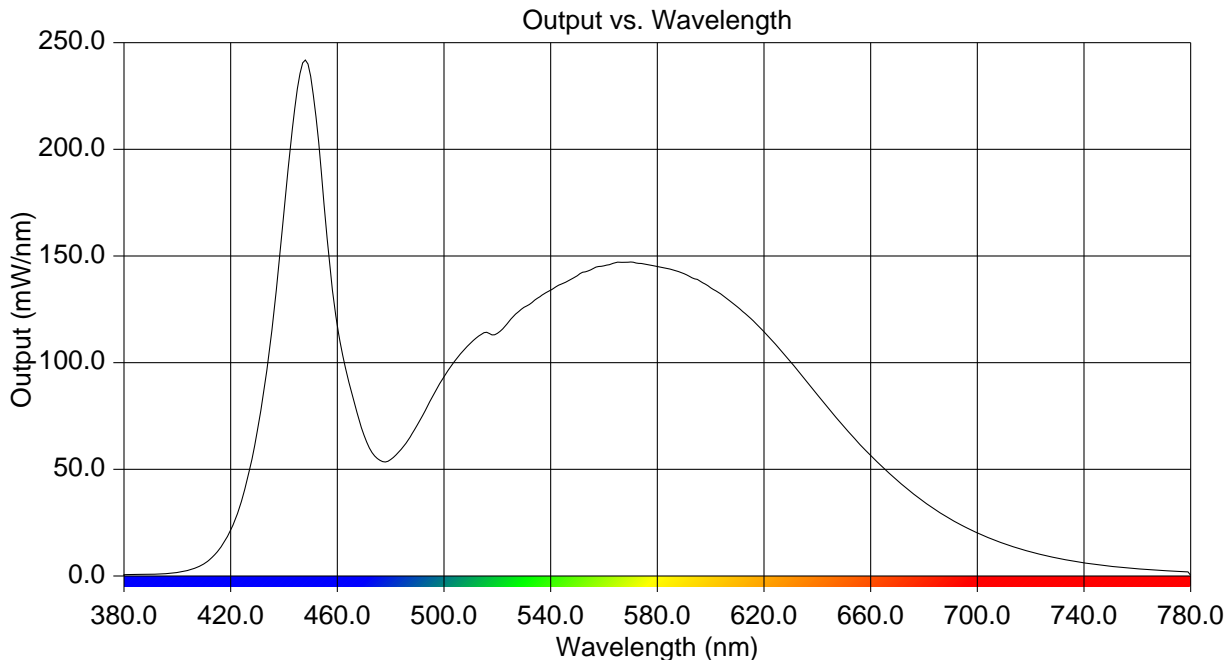
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB03140
 DATE: 4/3/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED82/480/D10 (ALSO APPLIES TO 347/RCL) (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.590	515	114.055	650	69.853
385	0.682	520	113.727	655	62.981
390	0.813	525	120.332	660	56.468
395	1.082	530	125.948	665	50.442
400	1.677	535	130.178	670	44.795
405	2.983	540	134.021	675	39.536
410	5.752	545	137.357	680	34.719
415	11.346	550	140.749	685	30.492
420	21.411	555	143.487	690	26.607
425	39.449	560	145.396	695	23.225
430	68.069	565	147.108	700	20.231
435	110.285	570	147.187	705	17.494
440	170.275	575	146.114	710	15.138
445	228.335	580	145.148	715	13.108
450	234.262	585	143.783	720	11.308
455	174.377	590	141.753	725	9.704
460	117.240	595	139.034	730	8.370
465	87.584	600	135.093	735	7.204
470	66.030	605	131.082	740	6.160
475	55.062	610	126.173	745	5.316
480	54.586	615	120.759	750	4.585
485	61.035	620	114.536	755	3.935
490	70.835	625	107.864	760	3.373
495	82.598	630	100.343	765	2.923
500	93.511	635	92.723	770	2.508
505	102.186	640	85.013	775	2.165
510	109.206	645	77.287	780	0.327



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CIE Chromaticity Diagram

