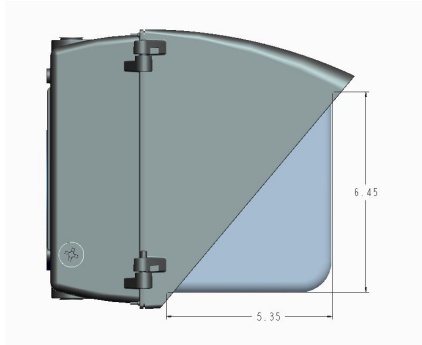


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

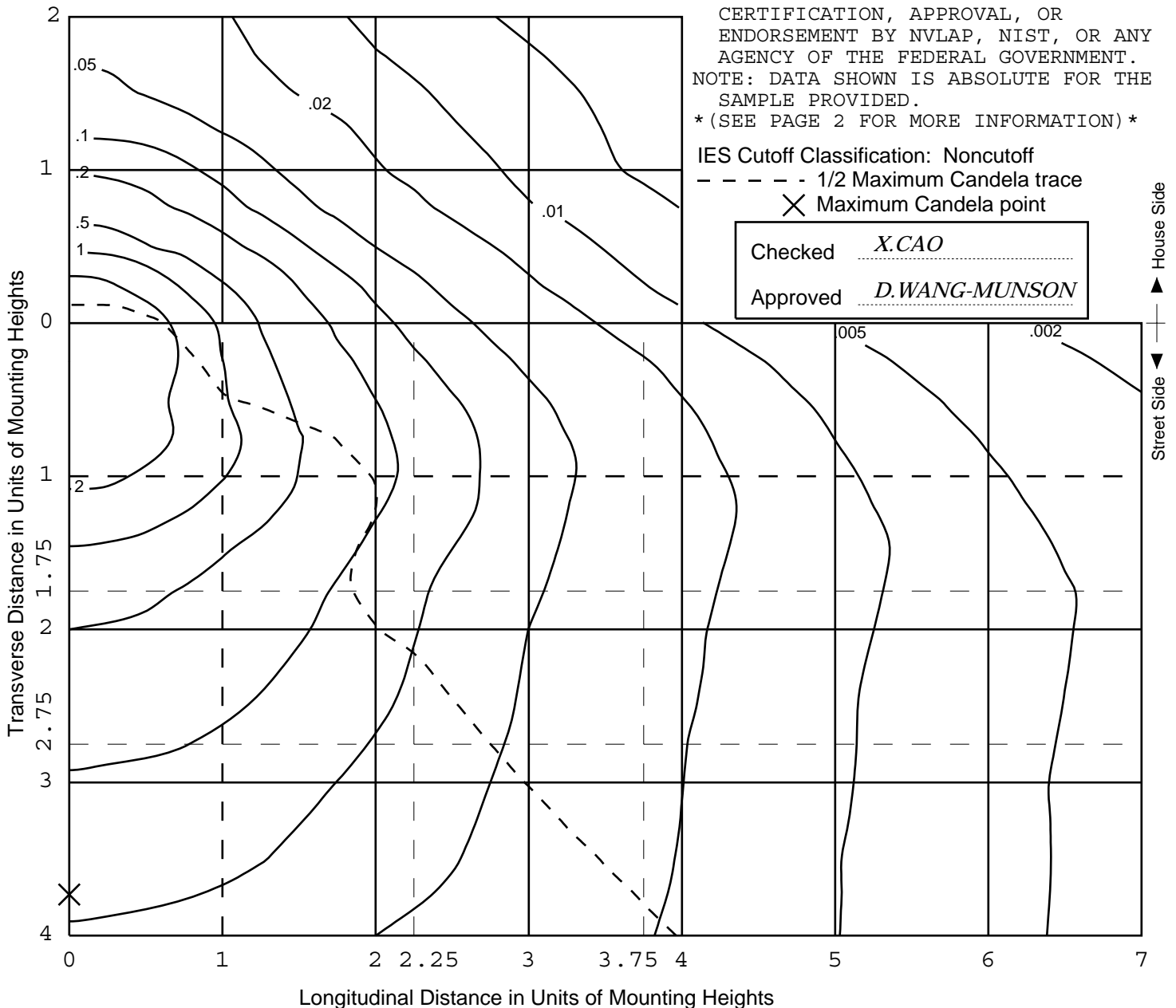
Values based on 20 foot mounting height.



REPORT NUMBER: RAB03166
 ISSUE DATE: 04/11/17 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 04/11/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65N,
 WP3LED65N/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: RAB03166
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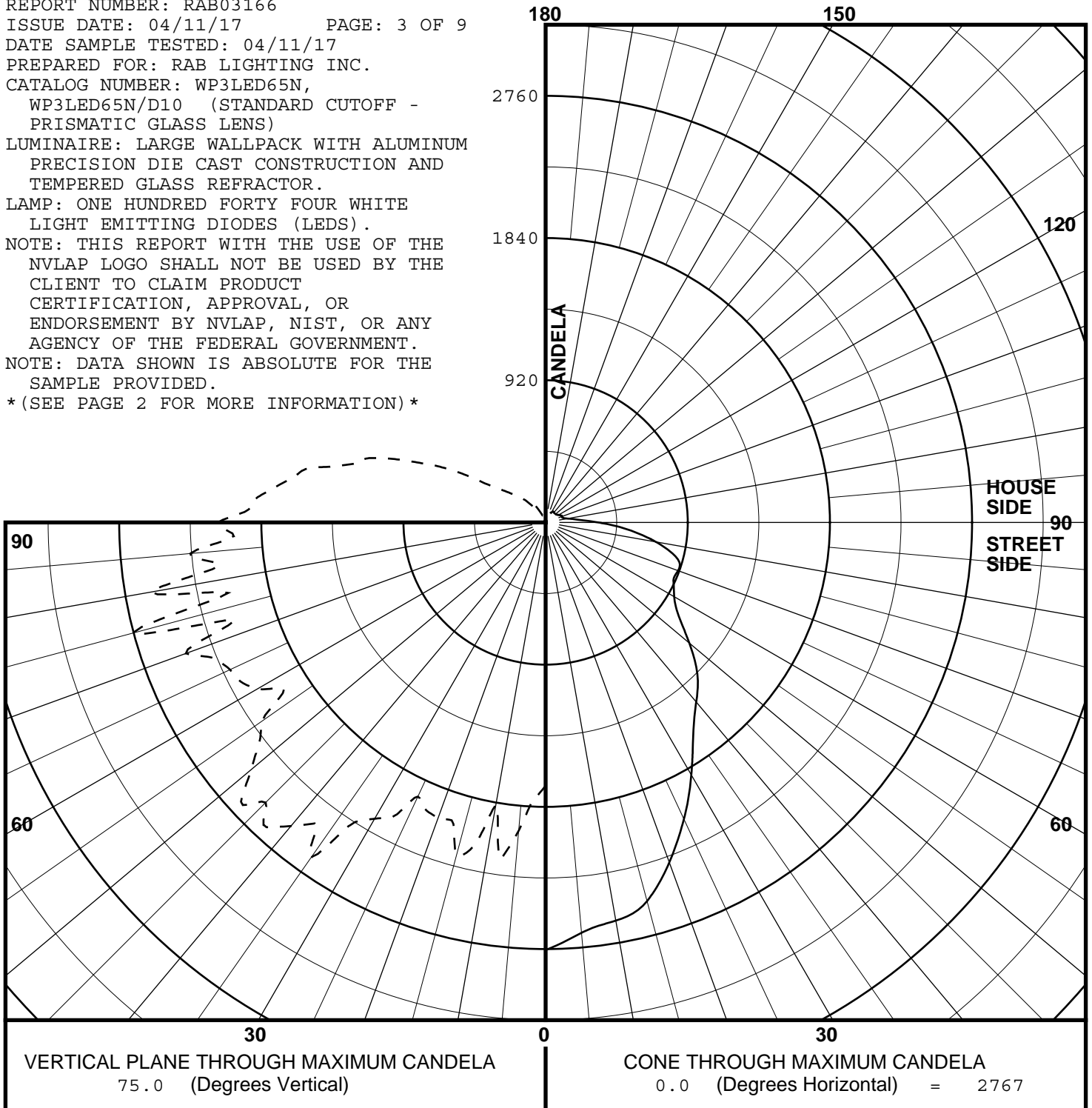
PAGE: 2 OF 9
DATE SAMPLE TESTED: 04/11/17

ADDITIONAL INFORMATION

TOTAL INPUT WATTS = 60.171 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: 24.8
ACCREDITED LABORATORY CODE 201058-0

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

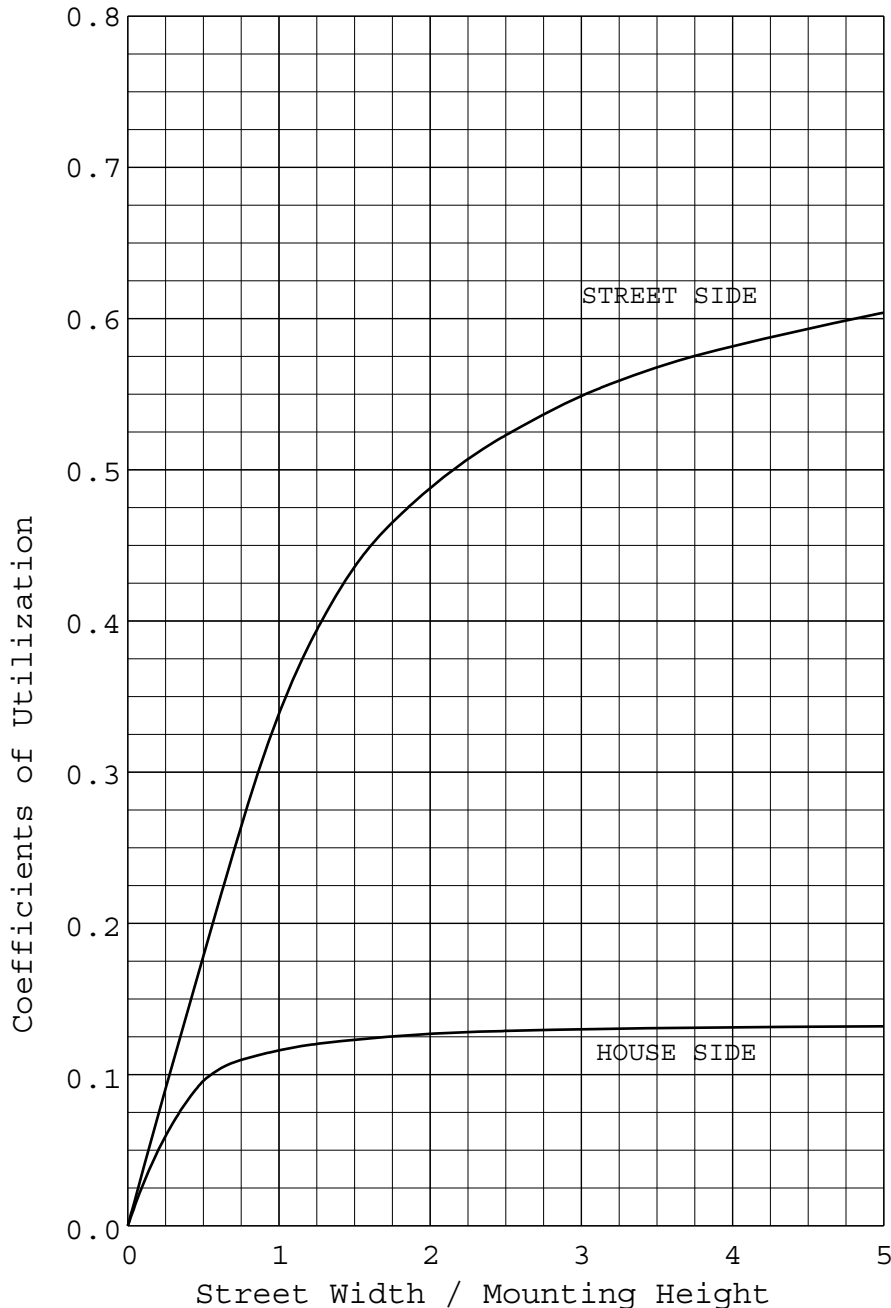
REPORT NUMBER: RAB03166
 ISSUE DATE: 04/11/17 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 04/11/17
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65N,
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 SAMPLE PROVIDED.
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REPORT NUMBER: RAB03166
ISSUE DATE: 04/11/17
PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9
DATE SAMPLE TESTED: 04/11/17

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	5211.	68.6
DOWNWARD HOUSE SIDE	1022.	13.5
DOWNWARD TOTAL	6232.	82.1
UPWARD STREET SIDE	1307.	17.2
UPWARD HOUSE SIDE	51.	0.7
UPWARD TOTAL	1358.	17.9
TOTAL FLUX	7591.	100.0

TOTAL INPUT WATTS = 60.2
EFFICACY = 126.1 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: RAB03166
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 PREPARED FOR: RAB LIGHTING INC.

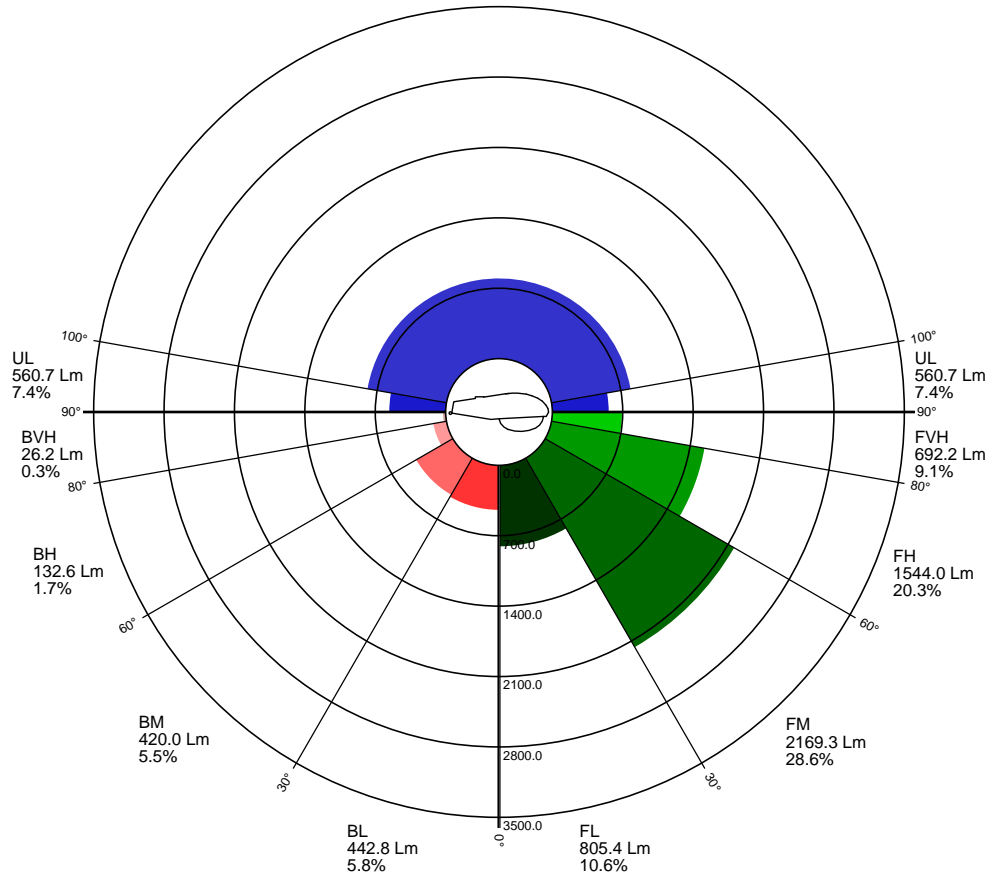
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 04/11/17

BUG Rating:				B1 U4 G4		
Zonal Summary				Zone Ratings		
				B	U	G
Forward		5211	68.6			
FL	(0° - 30°)	805.4	10.6			
FM	(30° - 60°)	2169.3	28.6			
FH	(60° - 80°)	1544.0	20.3			G1
FVH	(80° - 90°)	692.2	9.1			G4
Backward		1022	13.5			
BL	(0° - 30°)	442.8	5.8	B1		
BM	(30° - 60°)	420.0	5.5	B1		
BH	(60° - 80°)	132.6	1.7	B1		G1
BVH	(80° - 90°)	26.2	0.3			G1
Upward		1358	17.9			
UL	(90° - 100°)	560.7	7.4		U4	
UH	(100° - 180°)	797.5	10.5		U4	
Trapped Light		0	0.0			
Total Flux		7591	100.0			

Zonal Lumen Summary

(Linear scale)

UH
797.5 Lm
10.5%

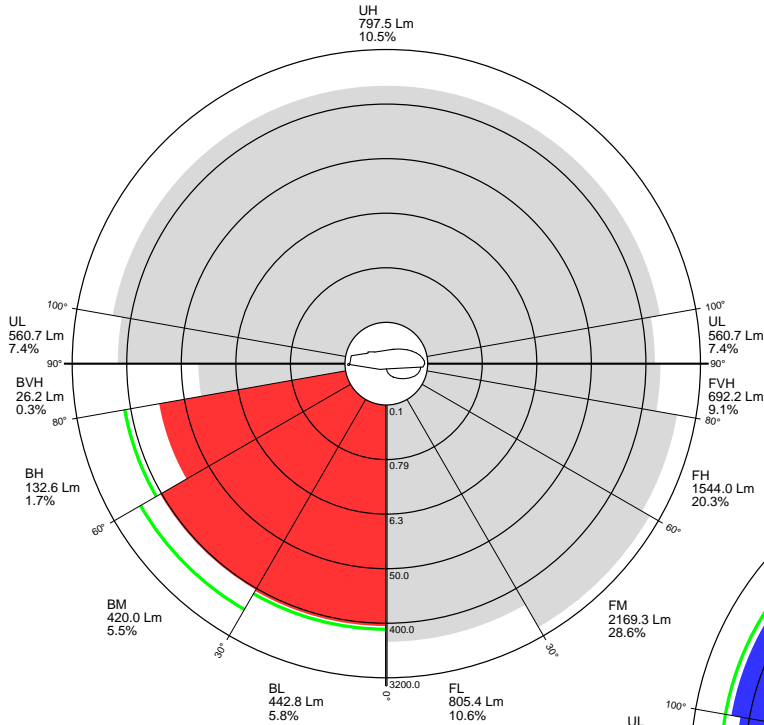


REPORT NUMBER: RAB03166
ISSUE DATE: 04/11/17
PREPARED FOR: RAB LIGHTING INC.

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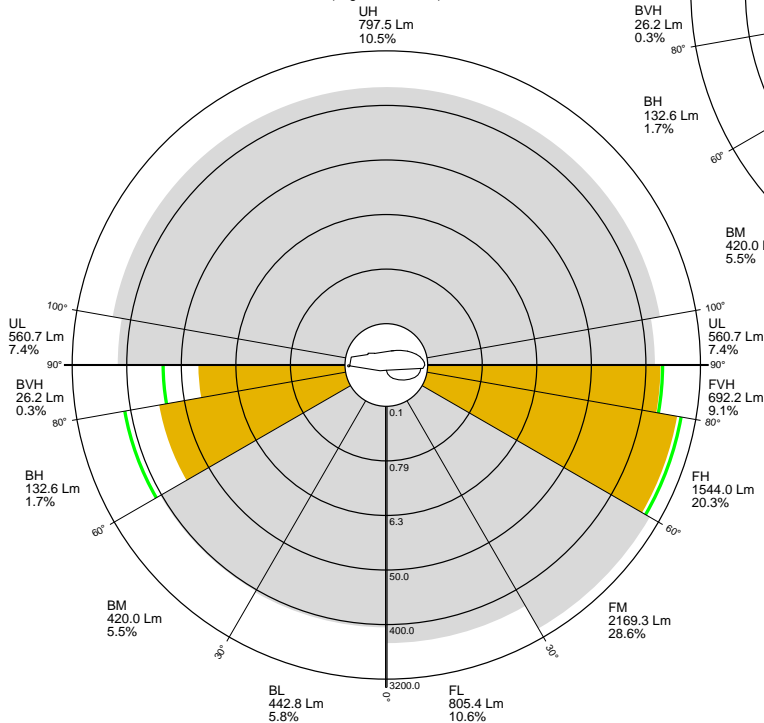
Backlight Rating Details

(Logarithmic scale)



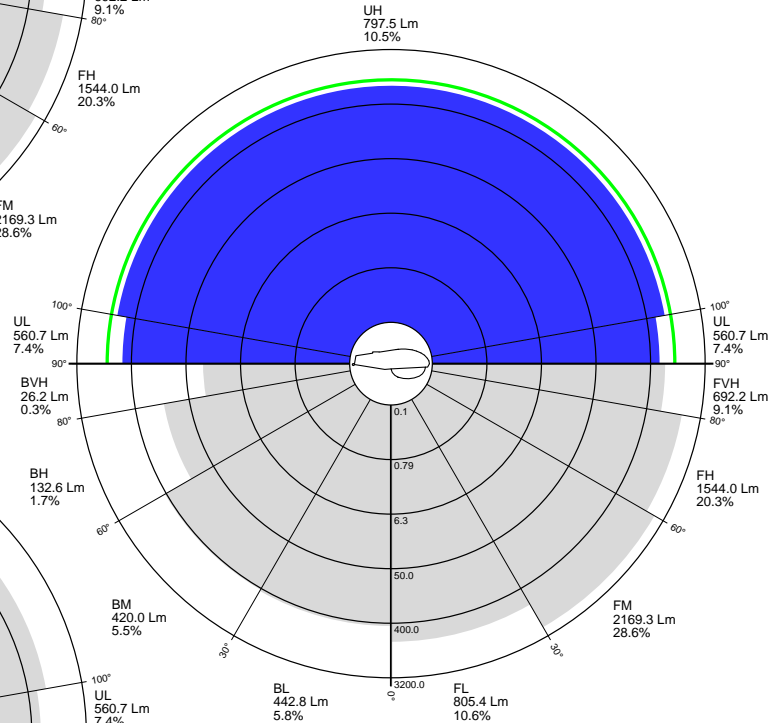
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB03166
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 PREPARED FOR: RAB LIGHTING INC.

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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	23.	23.	22.	20.	17.	13.	9.	7.	7.
	155.0	57.	56.	55.	52.	47.	40.	32.	22.	10.
	145.0	152.	153.	148.	139.	122.	92.	67.	50.	28.
	135.0	224.	219.	208.	175.	139.	100.	88.	80.	51.
	125.0	392.	377.	362.	329.	266.	197.	122.	75.	63.
	115.0	919.	883.	818.	691.	496.	358.	221.	118.	83.
	105.0	1406.	1345.	1325.	1177.	925.	668.	422.	241.	111.
	95.0	1871.	1807.	1767.	1619.	1368.	1017.	686.	461.	251.
	90.0	2120.	2054.	1996.	1828.	1576.	1193.	808.	549.	379.
	87.5	2021.	1960.	1955.	1806.	1597.	1242.	866.	606.	456.
	85.0	2308.	2239.	2206.	1972.	1680.	1290.	899.	655.	533.
V	82.5	2130.	2007.	1981.	1975.	1754.	1342.	944.	707.	619.
E	80.0	2589.	2513.	2454.	2079.	1699.	1374.	975.	764.	710.
R	77.5	2105.	2027.	1998.	1935.	1840.	1366.	1020.	838.	792.
T	75.0<<	2767.	2665.	2536.	2118.	1666.	1389.	1050.	913.	877.
I	72.5	2112.	2061.	2031.	1944.	1807.	1426.	1095.	1074.	949.
C	70.0	2477.	2379.	2329.	2015.	1675.	1382.	1165.	1248.	993.
A	67.5	2310.	2266.	2182.	2014.	1755.	1436.	1341.	1361.	1019.
L	65.0	2254.	2181.	2128.	1889.	1640.	1491.	1577.	1331.	997.
	62.5	2227.	2178.	2091.	1864.	1692.	1710.	1696.	1451.	1003.
A	60.0	2153.	2106.	1998.	1869.	1860.	1897.	1798.	1495.	951.
N	57.5	2009.	1970.	1962.	1972.	2018.	2058.	1869.	1489.	955.
G	55.0	2242.	2182.	2235.	2175.	2234.	2144.	1898.	1481.	989.
L	52.5	2336.	2325.	2321.	2358.	2315.	2158.	1957.	1405.	1032.
E	50.0	2487.	2494.	2492.	2517.	2353.	2236.	1928.	1361.	1085.
	47.5	2674.	2689.	2699.	2484.	2349.	2213.	1892.	1329.	1156.
	45.0	2562.	2610.	2577.	2563.	2405.	2218.	1783.	1366.	1235.
	42.5	2674.	2715.	2584.	2488.	2382.	2145.	1680.	1420.	1314.
	40.0	2564.	2577.	2668.	2470.	2365.	2023.	1583.	1485.	1407.
	37.5	2455.	2512.	2489.	2567.	2238.	1912.	1594.	1565.	1502.
	35.0	2645.	2695.	2566.	2309.	2080.	1812.	1654.	1645.	1578.
	30.0	2213.	2252.	2159.	2111.	1873.	1811.	1821.	1795.	1646.
	25.0	1957.	1944.	1938.	1975.	1957.	1950.	1842.	1728.	1684.
	20.0	2034.	2017.	2059.	2059.	2075.	1942.	2118.	2067.	1844.
	15.0	2222.	2201.	2084.	1886.	2200.	1994.	2078.	1756.	1903.
	10.0	1855.	1860.	1788.	1871.	2275.	2032.	1788.	1992.	1777.
	5.0	2003.	1977.	2008.	2010.	1977.	1928.	1789.	1778.	1737.
	0.0	1703.	1703.	1703.	1703.	1703.	1703.	1703.	1703.	1703.

||
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03166
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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
	180.0	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
	175.0	7.	7.	7.	7.	6.	6.	5.	4.	2.	2.
	165.0	7.	7.	7.	7.	6.	6.	5.	4.	3.	3.
	155.0	8.	8.	7.	7.	7.	6.	5.	5.	4.	4.
	145.0	11.	9.	8.	9.	8.	7.	6.	5.	5.	4.
	135.0	19.	16.	12.	12.	10.	7.	6.	5.	5.	4.
	125.0	32.	27.	21.	18.	14.	10.	6.	5.	5.	5.
	115.0	53.	43.	36.	27.	19.	13.	9.	6.	6.	6.
	105.0	56.	47.	43.	39.	25.	17.	12.	9.	9.	9.
	95.0	55.	55.	53.	50.	34.	22.	15.	12.	11.	11.
	90.0	63.	57.	64.	60.	40.	25.	17.	12.	11.	11.
	87.5	84.	64.	72.	67.	46.	29.	19.	13.	11.	11.
	85.0	117.	78.	79.	78.	53.	37.	22.	13.	11.	11.
V	82.5	161.	102.	89.	89.	61.	54.	35.	28.	24.	27.
E	80.0	218.	129.	99.	100.	70.	67.	49.	43.	39.	40.
R	77.5	282.	166.	108.	106.	80.	75.	68.	55.	54.	53.
T	75.0<<	341.	209.	116.	108.	88.	80.	87.	65.	66.	69.
I	72.5	390.	254.	128.	111.	95.	84.	104.	76.	72.	79.
C	70.0	433.	298.	147.	114.	101.	89.	111.	97.	79.	84.
A	67.5	464.	342.	174.	120.	110.	93.	108.	119.	91.	87.
L	65.0	501.	393.	207.	131.	120.	99.	102.	134.	110.	98.
	62.5	540.	435.	246.	147.	131.	114.	102.	127.	139.	121.
A	60.0	578.	481.	286.	171.	143.	131.	111.	115.	150.	154.
N	57.5	638.	529.	334.	201.	158.	150.	128.	116.	131.	157.
G	55.0	688.	584.	381.	237.	176.	168.	149.	132.	123.	130.
L	52.5	756.	648.	434.	277.	200.	185.	171.	154.	137.	126.
E	50.0	822.	711.	492.	315.	228.	200.	192.	179.	163.	154.
	47.5	894.	779.	553.	354.	261.	219.	211.	203.	193.	187.
	45.0	971.	858.	619.	412.	295.	243.	223.	222.	213.	211.
	42.5	1050.	934.	685.	477.	330.	271.	237.	234.	222.	219.
	40.0	1128.	1011.	758.	548.	377.	302.	259.	245.	232.	226.
	37.5	1206.	1090.	840.	626.	446.	340.	289.	261.	247.	238.
	35.0	1286.	1164.	908.	717.	528.	389.	327.	285.	271.	261.
	30.0	1428.	1312.	1067.	886.	724.	589.	455.	382.	339.	323.
	25.0	1548.	1406.	1213.	1062.	934.	795.	692.	614.	534.	503.
	20.0	1661.	1497.	1367.	1242.	1085.	1002.	895.	860.	793.	766.
	15.0	1713.	1598.	1463.	1378.	1278.	1163.	1143.	1080.	1006.	986.
	10.0	1705.	1760.	1555.	1487.	1438.	1370.	1304.	1278.	1248.	1240.
	5.0	1676.	1707.	1724.	1581.	1537.	1527.	1485.	1479.	1468.	1465.
	0.0	1703.	1703.	1703.	1703.	1703.	1703.	1703.	1703.	1703.	1703.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB03166
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 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
 DATE SAMPLE TESTED: 04/11/17

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	41
5- 10	121
10- 15	195
15- 20	257
20- 25	301
25- 30	334
30- 35	372
35- 40	410
40- 45	442
45- 50	464
50- 55	461
55- 60	440
60- 65	429
65- 70	427
70- 75	417
75- 80	404
80- 85	377
85- 90	341
90- 95	302
95-100	259
100-105	215
105-110	170
110-115	130
115-120	89
120-125	60
125-130	41
130-135	29
135-140	21
140-145	16
145-150	12
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	162
0- 20	613
0- 30	1248
0- 40	2030
0- 50	2936
0- 60	3837
0- 70	4693
0- 80	5514
0- 90	6232
0-100	6793
0-110	7178
0-120	7397
0-130	7498
0-140	7548
0-150	7577
0-160	7587
0-170	7590
0-180	7591

REPORT NUMBER: RAB03167
 DATE: 4/11/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65N, WP3LED65N/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	04/10/18

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: RAB03167
 DATE: 4/11/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65N, WP3LED65N/D10 (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	7591 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3771
Chromaticity Ordinate y	0.3772
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2228
Chromaticity Ordinate v'	0.5013
Correlated Color Temp CCT (K)	4094
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	23195 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.503
Input Power (Watts)	60.2
Input Power Factor (%)	99.8
Input Current THD (%)	6.1
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	126.1
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.231
Input Power (Watts)	59.3
Input Power Factor (%)	92.8
Input Current THD (%)	9.7
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	81
R2 Dark greyish yellow	89
R3 Strong yellowish green	95
R4 Moderate yellowish green	83
R5 Light bluish green	82
R6 Light blue	85
R7 Light violet	87
R8 Light reddish purple	65
R9 Strong red	9
R10 Strong yellow	74
R11 Strong green	82
R12 Strong blue	67
R13 Light yellowish pink (skin)	83
R14 Moderate olive green (leaf)	97

*NOTE:

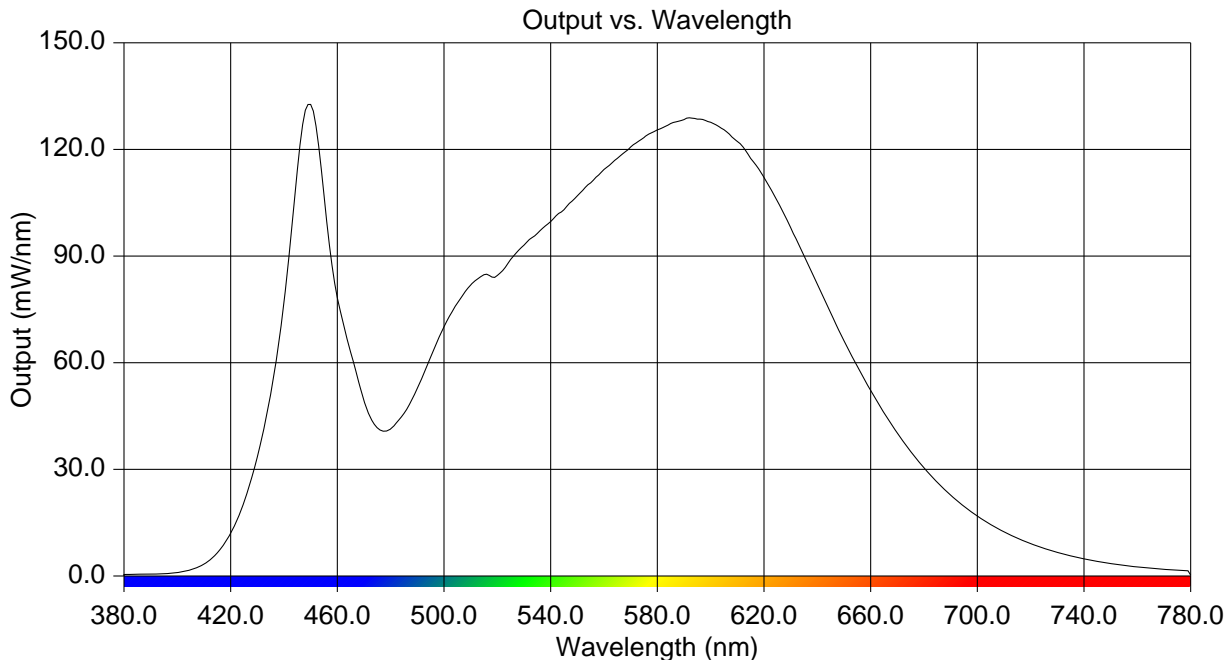
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB03167
 DATE: 4/11/2017
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: WP3LED65N, WP3LED65N/D10 (STANDARD CUTOFF - PRISMATIC GLASS LENS)

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.415	515	84.743	650	66.154
385	0.489	520	84.531	655	58.938
390	0.515	525	89.035	660	52.150
395	0.648	530	93.049	665	45.877
400	0.975	535	96.347	670	40.144
405	1.735	540	99.686	675	35.117
410	3.354	545	103.019	680	30.420
415	6.521	550	106.923	685	26.370
420	12.005	555	110.568	690	22.696
425	20.856	560	114.338	695	19.673
430	33.487	565	117.461	700	16.850
435	51.034	570	120.659	705	14.478
440	77.167	575	123.311	710	12.396
445	114.153	580	125.472	715	10.568
450	132.621	585	127.255	720	9.066
455	107.150	590	128.359	725	7.744
460	78.212	595	128.494	730	6.632
465	62.901	600	127.613	735	5.648
470	49.224	605	125.518	740	4.820
475	41.678	610	122.262	745	4.138
480	41.378	615	117.441	750	3.529
485	45.728	620	112.149	755	3.028
490	52.802	625	105.528	760	2.590
495	61.600	630	97.984	765	2.238
500	70.092	635	89.948	770	1.912
505	76.810	640	82.111	775	1.654
510	81.829	645	74.022	780	0.249



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CIE Chromaticity Diagram

