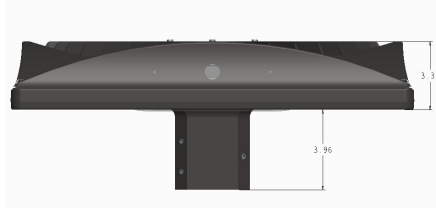


## ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 25 foot mounting height.



REPORT NUMBER: RAB01412  
ISSUE DATE: 12/16/15 PAGE: 1 OF 9  
DATE SAMPLE TESTED: 12/16/15  
PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: ALED5S78Y/480/D10 (TYPE V Square)

LUMINAIRE: CAST FINNED METAL HOUSING, 4 WHITE CIRCUIT BOARD WITH 11 LEDS, MOLDED 1-PIECE PLASTIC REFLECTOR WITH SPECULAR FINISH, CLEAR POLYCARBONATE LENS IN CAST BRONZE PAINTED METAL FRAME.

LAMP: FORTY-FOUR WHITE LIGHT EMITTING DIODES (LEDs), TILTED 80-DEGREES FROM VERTICAL BASE-UP POSITION.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS: 74.887 W AT 480.0 VOLTS

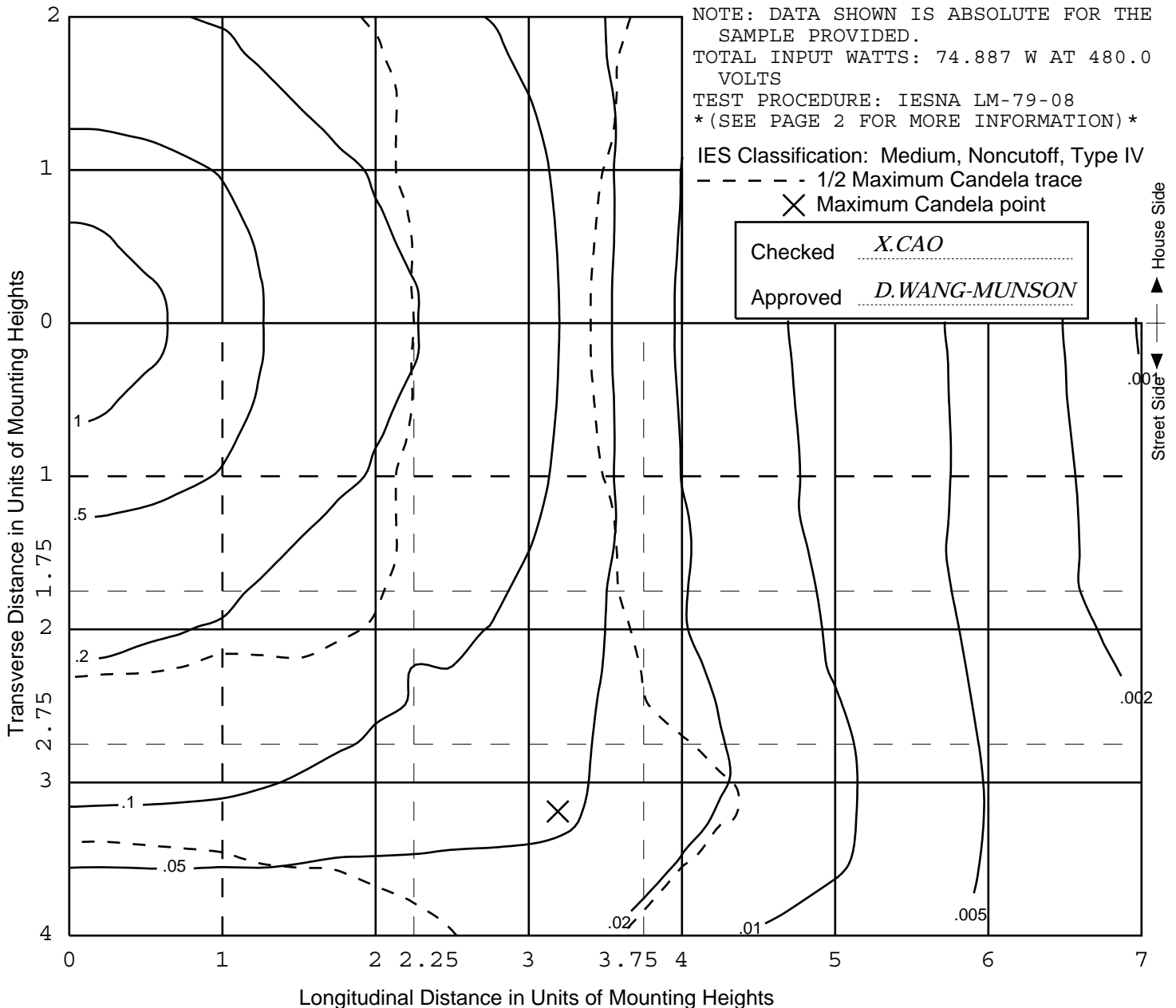
TEST PROCEDURE: IESNA LM-79-08

\*(SEE PAGE 2 FOR MORE INFORMATION)\*

IES Classification: Medium, Noncutoff, Type IV

--- 1/2 Maximum Candela trace

× Maximum Candela point



REPORT NUMBER: RAB01412  
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PREPARED FOR: RAB LIGHTING INC.

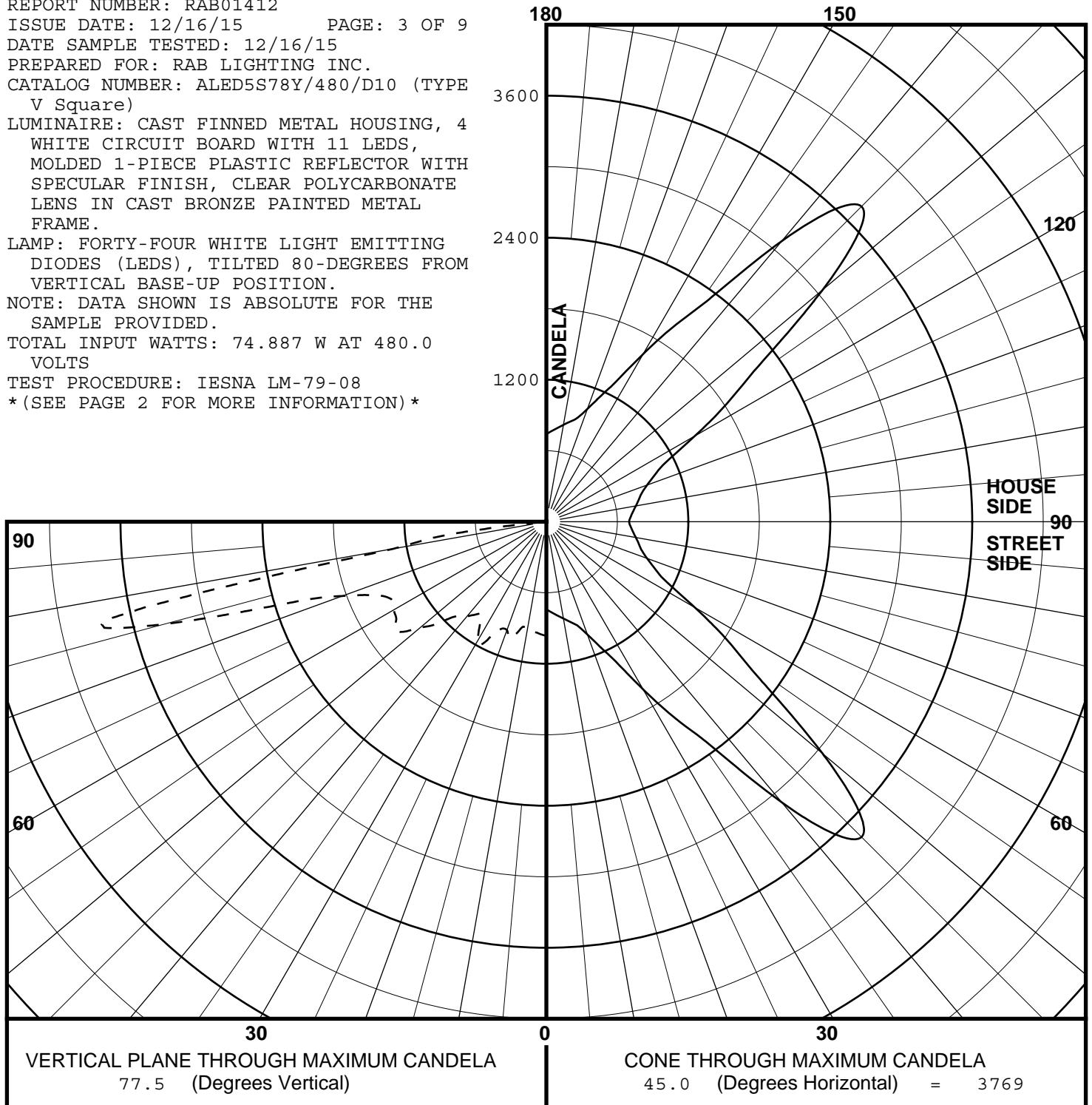
PAGE: 2 OF 9  
DATE SAMPLE TESTED: 12/16/15

ADDITIONAL INFORMATION

TEST DISTANCE: 28.25 FEET  
LED DRIVER: RDD-H100-A2000-480  
ACCREDITED LABORATORY CODE 201085-0

## MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

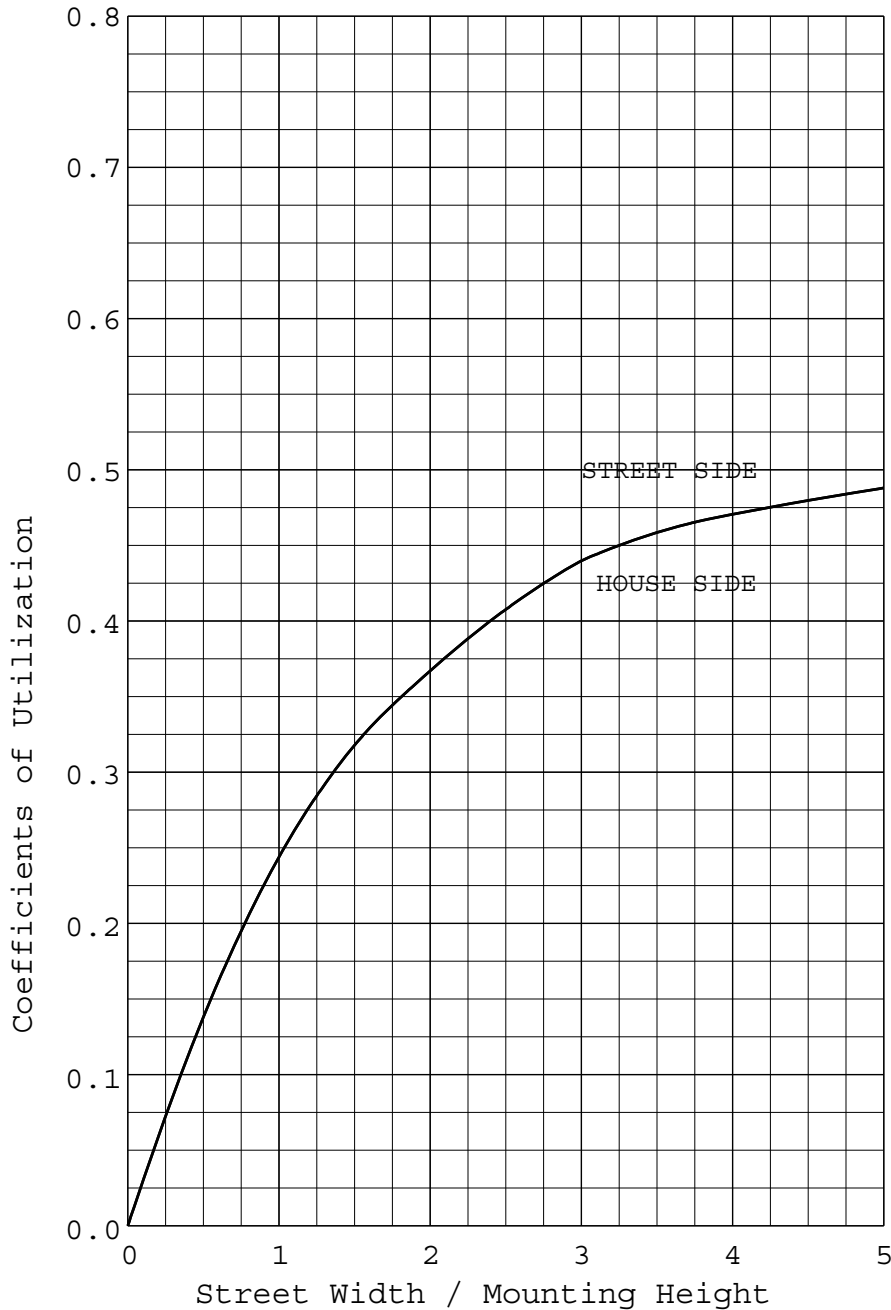
REPORT NUMBER: RAB01412  
 ISSUE DATE: 12/16/15 PAGE: 3 OF 9  
 DATE SAMPLE TESTED: 12/16/15  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: ALED5S78Y/480/D10 (TYPE V Square)  
 LUMINAIRE: CAST FINNED METAL HOUSING, 4 WHITE CIRCUIT BOARD WITH 11 LEDS, MOLDED 1-PIECE PLASTIC REFLECTOR WITH SPECULAR FINISH, CLEAR POLYCARBONATE LENS IN CAST BRONZE PAINTED METAL FRAME.  
 LAMP: FORTY-FOUR WHITE LIGHT EMITTING DIODES (LEDs), TILTED 80-DEGREES FROM VERTICAL BASE-UP POSITION.  
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.  
 TOTAL INPUT WATTS: 74.887 W AT 480.0 VOLTS  
 TEST PROCEDURE: IESNA LM-79-08  
 \*(SEE PAGE 2 FOR MORE INFORMATION)\*



REPORT NUMBER: RAB01412  
 ISSUE DATE: 12/16/15  
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 9  
 DATE SAMPLE TESTED: 12/16/15

## COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	3940.	50.0
DOWNWARD HOUSE SIDE	3940.	50.0
DOWNWARD TOTAL	7881.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	7881.	100.0
TOTAL INPUT WATTS = 74.9		
EFFICACY = 105.2 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: RAB01412  
 ISSUE DATE: 12/16/15  
 PREPARED FOR: RAB LIGHTING INC.

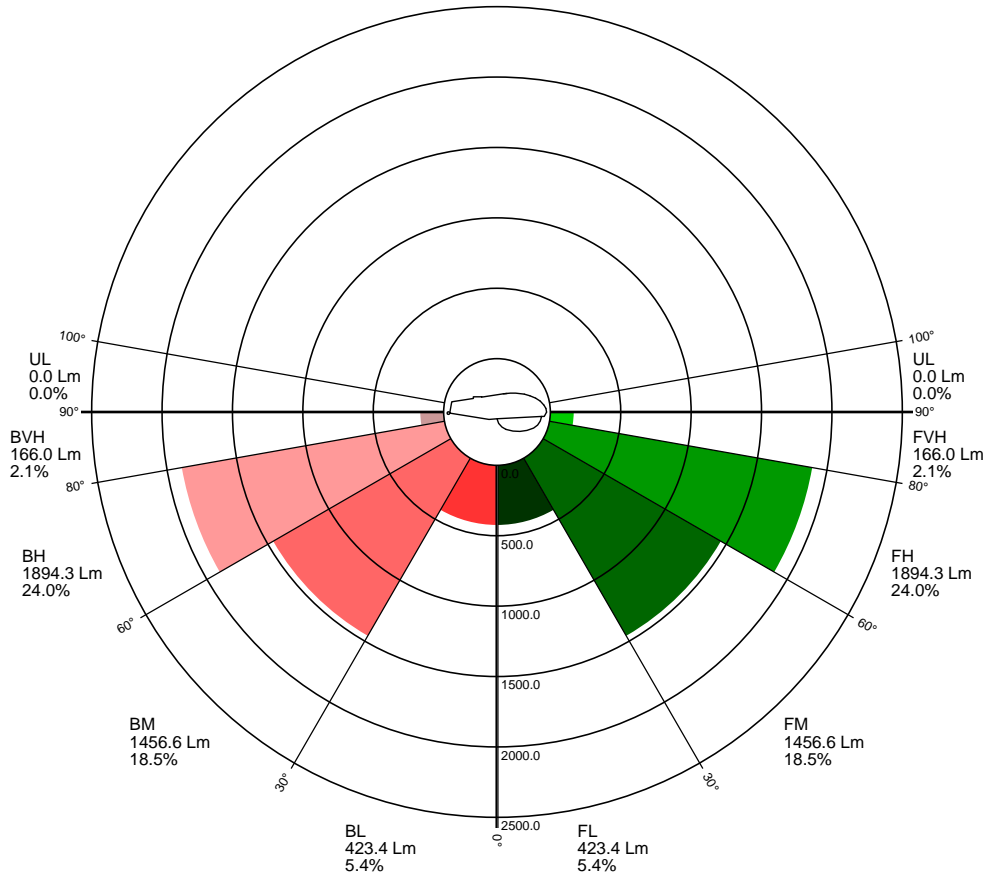
PAGE: 5 OF 9  
 DATE SAMPLE TESTED: 12/16/15

BUG Rating:				B3	U0	G2
Zonal Summary		Lumens	% of Fixture	Zone Ratings		
				B	U	G
Forward		3940	50.0			
FL	(0° – 30°)	423.4	5.4			
FM	(30° – 60°)	1456.6	18.5			
FH	(60° – 80°)	1894.3	24.0			G2
FVH	(80° – 90°)	166.0	2.1			G2
Backward		3940	50.0			
BL	(0° – 30°)	423.4	5.4	B1		
BM	(30° – 60°)	1456.6	18.5	B2		
BH	(60° – 80°)	1894.3	24.0	B3		G2
BVH	(80° – 90°)	166.0	2.1			G2
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		7881	100.0			

### Zonal Lumen Summary

(Linear scale)

UH  
0.0 Lm  
0.0%



REPORT NUMBER: RAB01412

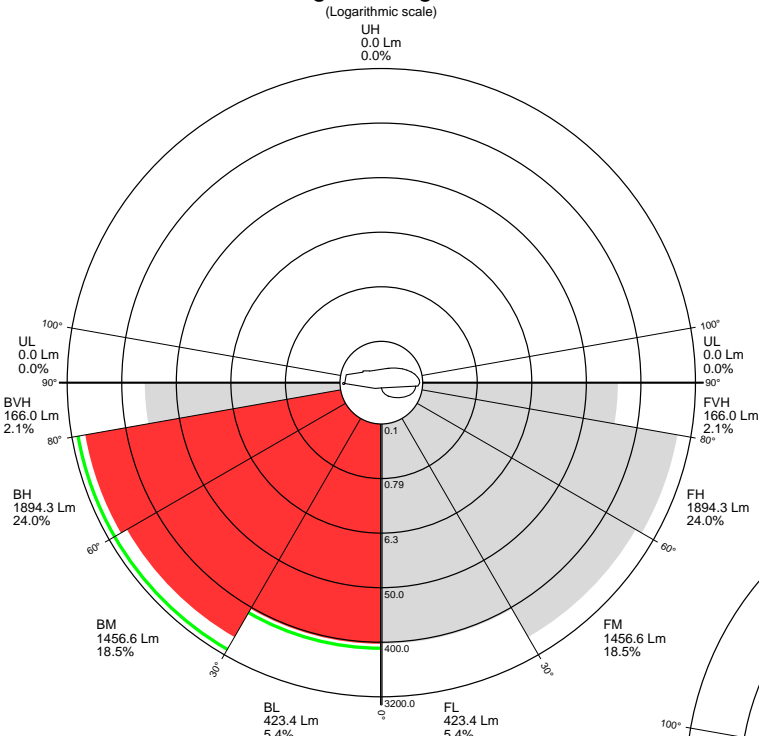
ISSUE DATE: 12/16/15

PREPARED FOR: RAB LIGHTING INC.

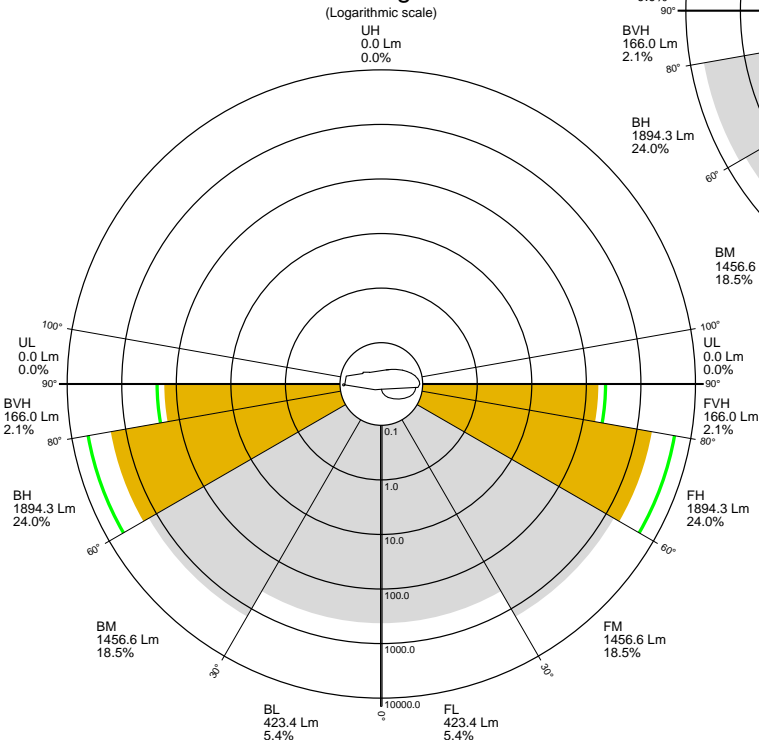
PAGE: 6 OF 9

DATE SAMPLE TESTED: 12/16/15

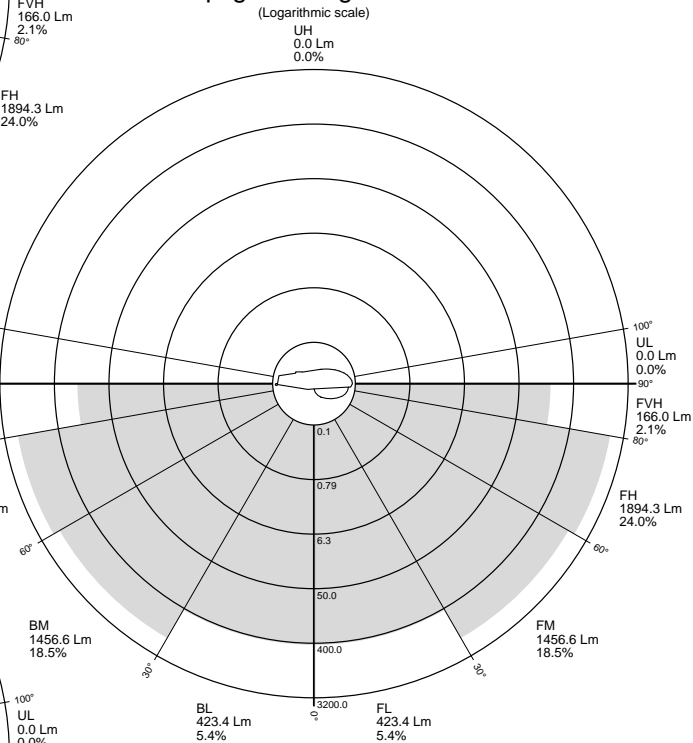
### Backlight Rating Details



### Glare Rating Details



### Uplight Rating Details



REPORT NUMBER: RAB01412  
 ISSUE DATE: 12/16/15  
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9  
 DATE SAMPLE TESTED: 12/16/15

### CANDELA TABULATION

	STREET SIDE									
	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0
180.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
175.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
165.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.5	5.	5.	5.	6.	11.	11.	10.	6.	4.	4.
85.0	18.	22.	52.	144.	250.	42.	235.	142.	40.	17.
V 82.5	68.	90.	243.	905.	830.	837.	946.	766.	231.	85.
E 80.0	635.	655.	776.	1041.	2040.	1307.	1865.	1065.	765.	665.
R 77.5<<	740.	782.	889.	1235.	2171.	3769.	2037.	1054.	820.	725.
T 75.0	1230.	1256.	1624.	2266.	2906.	3346.	3004.	2435.	1637.	1157.
I 72.5	2359.	2364.	2570.	2691.	2468.	2281.	2555.	2792.	2694.	2528.
C 70.0	2370.	2371.	2351.	2281.	1926.	1835.	1980.	2378.	2488.	2559.
A 67.5	2032.	2052.	1954.	1895.	1661.	1619.	1684.	1921.	2011.	2135.
L 65.0	1648.	1650.	1613.	1700.	1550.	1498.	1561.	1695.	1643.	1732.
62.5	1486.	1477.	1471.	1583.	1540.	1463.	1521.	1574.	1474.	1490.
A 60.0	1381.	1369.	1441.	1513.	1525.	1490.	1524.	1481.	1418.	1379.
N 57.5	1354.	1335.	1437.	1401.	1529.	1505.	1522.	1419.	1417.	1354.
G 55.0	1294.	1267.	1398.	1384.	1444.	1562.	1469.	1390.	1425.	1311.
L 52.5	1301.	1279.	1368.	1363.	1434.	1529.	1434.	1383.	1371.	1302.
E 50.0	1321.	1293.	1362.	1314.	1368.	1391.	1369.	1360.	1373.	1323.
47.5	1308.	1285.	1377.	1344.	1299.	1291.	1316.	1374.	1392.	1313.
45.0	1311.	1291.	1371.	1387.	1205.	1153.	1190.	1379.	1378.	1330.
42.5	1272.	1262.	1293.	1306.	1109.	1074.	1123.	1260.	1309.	1268.
40.0	1208.	1187.	1195.	1157.	1024.	1042.	1055.	1168.	1170.	1147.
37.5	1119.	1106.	1111.	1040.	1069.	989.	1049.	1052.	1113.	1097.
35.0	1051.	1031.	994.	1022.	1107.	961.	1069.	1009.	1032.	1053.
30.0	1031.	1015.	971.	977.	1040.	1162.	1019.	976.	990.	995.
25.0	1027.	1020.	1013.	1076.	1077.	1038.	1078.	1092.	1012.	1001.
20.0	1084.	1074.	1039.	968.	1012.	974.	1015.	1006.	1045.	1064.
15.0	994.	991.	965.	975.	968.	979.	981.	961.	964.	974.
10.0	981.	982.	966.	958.	932.	919.	902.	927.	924.	927.
5.0	959.	965.	977.	949.	944.	940.	938.	936.	952.	941.
0.0	964.	964.	964.	964.	964.	964.	964.	964.	964.	964.

||

PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB01412  
 ISSUE DATE: 12/16/15  
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9  
 DATE SAMPLE TESTED: 12/16/15

### 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	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
175.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
165.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.5	4.	4.	4.	6.	10.	11.	11.	6.	5.	5.	5.
85.0	13.	17.	40.	142.	235.	42.	250.	144.	52.	22.	18.
V 82.5	62.	85.	231.	766.	946.	837.	830.	905.	243.	90.	68.
E 80.0	635.	665.	765.	1065.	1865.	1307.	2040.	1041.	776.	655.	635.
R 77.5<<	700.	725.	820.	1054.	2037.	3769.	2171.	1235.	889.	782.	740.
T 75.0	1105.	1157.	1637.	2435.	3004.	3346.	2906.	2266.	1624.	1256.	1230.
I 72.5	2511.	2528.	2694.	2792.	2555.	2281.	2468.	2691.	2570.	2364.	2359.
C 70.0	2525.	2559.	2488.	2378.	1980.	1835.	1926.	2281.	2351.	2371.	2370.
A 67.5	2121.	2135.	2011.	1921.	1684.	1619.	1661.	1895.	1954.	2052.	2032.
L 65.0	1718.	1732.	1643.	1695.	1561.	1498.	1550.	1700.	1613.	1650.	1648.
62.5	1472.	1490.	1474.	1574.	1521.	1463.	1540.	1583.	1471.	1477.	1486.
A 60.0	1351.	1379.	1418.	1481.	1524.	1490.	1525.	1513.	1441.	1369.	1381.
N 57.5	1353.	1354.	1417.	1419.	1522.	1505.	1529.	1401.	1437.	1335.	1354.
G 55.0	1296.	1311.	1425.	1390.	1469.	1562.	1444.	1384.	1398.	1267.	1294.
L 52.5	1301.	1302.	1371.	1383.	1434.	1529.	1434.	1363.	1368.	1279.	1301.
E 50.0	1321.	1323.	1373.	1360.	1369.	1391.	1368.	1314.	1362.	1293.	1321.
47.5	1314.	1313.	1392.	1374.	1316.	1291.	1299.	1344.	1377.	1285.	1308.
45.0	1319.	1330.	1378.	1379.	1190.	1153.	1205.	1387.	1371.	1291.	1311.
42.5	1278.	1268.	1309.	1260.	1123.	1074.	1109.	1306.	1293.	1262.	1272.
40.0	1166.	1147.	1170.	1168.	1055.	1042.	1024.	1157.	1195.	1187.	1208.
37.5	1103.	1097.	1113.	1052.	1049.	989.	1069.	1040.	1111.	1106.	1119.
35.0	1063.	1053.	1032.	1009.	1069.	961.	1107.	1022.	994.	1031.	1051.
30.0	995.	995.	990.	976.	1019.	1162.	1040.	977.	971.	1015.	1031.
25.0	996.	1001.	1012.	1092.	1078.	1038.	1077.	1076.	1013.	1020.	1027.
20.0	1063.	1064.	1045.	1006.	1015.	974.	1012.	968.	1039.	1074.	1084.
15.0	971.	974.	964.	961.	981.	979.	968.	975.	965.	991.	994.
10.0	921.	927.	924.	927.	902.	919.	932.	958.	966.	982.	981.
5.0	933.	941.	952.	936.	938.	940.	944.	949.	977.	965.	959.
0.0	964.	964.	964.	964.	964.	964.	964.	964.	964.	964.	964.

CONE OF MAXIMUM CANDELA



REPORT NUMBER: RAB01412  
 ISSUE DATE: 12/16/15  
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9  
 DATE SAMPLE TESTED: 12/16/15

### 5-DEGREE ZONAL LUMEN SUMMARY

0- 5	23
5- 10	67
10- 15	114
15- 20	163
20- 25	219
25- 30	260
30- 35	301
35- 40	359
40- 45	452
45- 50	537
50- 55	601
55- 60	663
60- 65	742
65- 70	966
70- 75	1244
75- 80	836
80- 85	316
85- 90	16
90- 95	0
95-100	0
100-105	0
105-110	0
110-115	0
115-120	0
120-125	0
125-130	0
130-135	0
135-140	0
140-145	0
145-150	0
150-155	0
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

### 10-DEGREE ZONAL LUMEN SUMMARY

0- 10	90
0- 20	368
0- 30	847
0- 40	1507
0- 50	2496
0- 60	3760
0- 70	5469
0- 80	7549
0- 90	7881
0-100	7881
0-110	7881
0-120	7881
0-130	7881
0-140	7881
0-150	7881
0-160	7881
0-170	7881
0-180	7881

REPORT NUMBER: RAB01413  
 DATE: 12/16/2015  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: ALED5S78Y/480/D10 (TYPE V Square)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED METAL HOUSING, 4 WHITE CIRCUIT BOARD WITH 11 LEDS, MOLDED 1-PIECE PLASTIC REFLECTOR WITH SPECULAR FINISH, CLEAR POLYCARBONATE LENS IN CAST BRONZE PAINTED METAL FRAME.

LAMP: FORTY-FOUR WHITE LIGHT EMITTING DIODES (LEDs), TILTED 80-DEGREES FROM VERTICAL BASE-UP POSITION.

DRIVER: RDD-H100-A2000-480

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:	CHROMA PROGRAMMABLE AC POWER SOURCE MODEL 61602	Calibration Due: N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	3/9/16
	OCEAN OPTICS QE65PRO Spectroradiometer	11/10/16
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	11/10/16

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: RAB01413  
 DATE: 12/16/2015  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: ALED5S78Y/480/D10 (TYPE V Square)

Page 2 of 4

### RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	7881 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4318
Chromaticity Ordinate y	0.4072
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2459
Chromaticity Ordinate v'	0.5218
Correlated Color Temp CCT (K)	3114
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	22719 *
ELECTRICAL	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.180
Input Power (Watts)	74.9
Input Power Factor (%)	86.7
Input Current THD (%)	14.8
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	105.2
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.221
Input Power (Watts)	73.3
Input Power Factor (%)	95.6
Input Current THD (%)	11.9
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	73
R1 Light greyish red	70
R2 Dark greyish yellow	80
R3 Strong yellowish green	89
R4 Moderate yellowish green	73
R5 Light bluish green	70
R6 Light blue	73
R7 Light violet	80
R8 Light reddish purple	50
R9 Strong red	-23
R10 Strong yellow	54
R11 Strong green	70
R12 Strong blue	50
R13 Light yellowish pink (skin)	71
R14 Moderate olive green (leaf)	94

### \*NOTE:

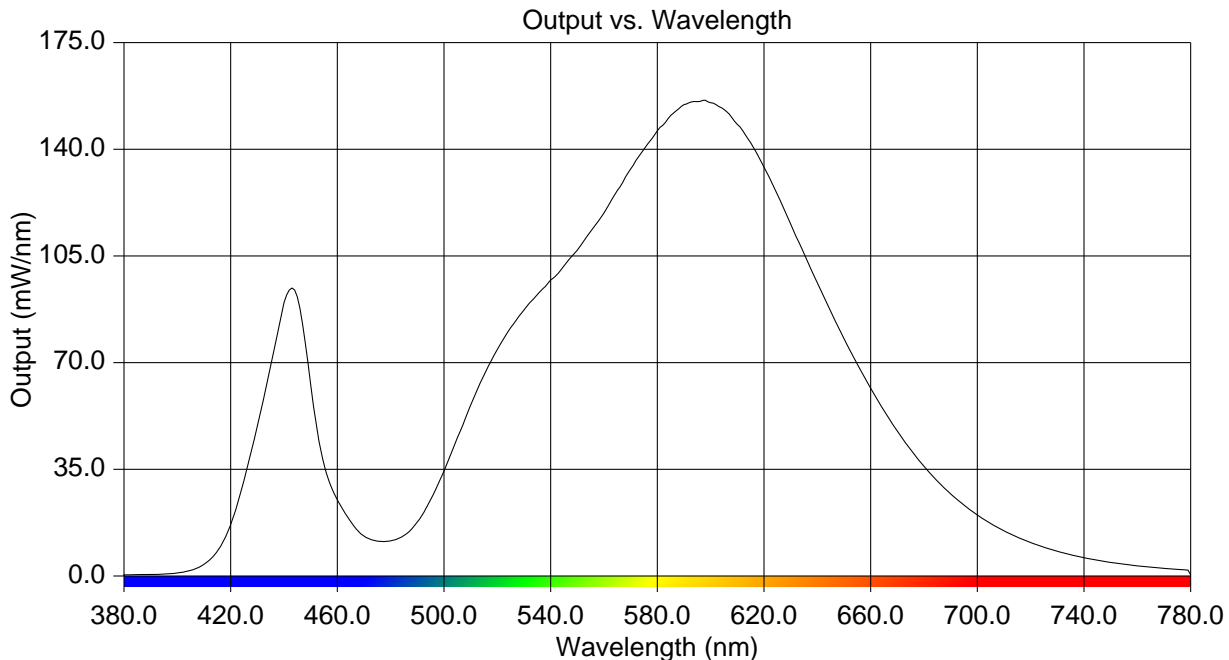
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB01413  
 DATE: 12/16/2015  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: ALED5S78Y/480/D10 (TYPE V Square)

Page 3 of 4

### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.362	515	65.960	650	77.814
385	0.418	520	74.477	655	69.466
390	0.506	525	81.492	660	61.694
395	0.626	530	87.293	665	54.218
400	0.975	535	92.339	670	47.583
405	1.817	540	97.152	675	41.391
410	3.851	545	101.737	680	35.991
415	8.064	550	106.929	685	31.117
420	16.876	555	113.104	690	26.942
425	31.357	560	119.138	695	23.269
430	49.049	565	126.454	700	19.996
435	68.756	570	133.556	705	17.191
440	89.694	575	140.125	710	14.803
445	91.590	580	146.063	715	12.752
450	62.842	585	151.101	720	10.984
455	36.620	590	154.674	725	9.409
460	24.984	595	155.649	730	8.094
465	17.870	600	155.287	735	6.978
470	13.146	605	153.088	740	6.007
475	11.420	610	148.179	745	5.169
480	11.531	615	142.181	750	4.453
485	13.301	620	134.275	755	3.855
490	17.731	625	125.198	760	3.319
495	25.026	630	115.549	765	2.869
500	34.467	635	105.763	770	2.492
505	45.345	640	96.168	775	2.169
510	56.118	645	86.836	780	0.328



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Page 4 of 4

## CIE Chromaticity Diagram

