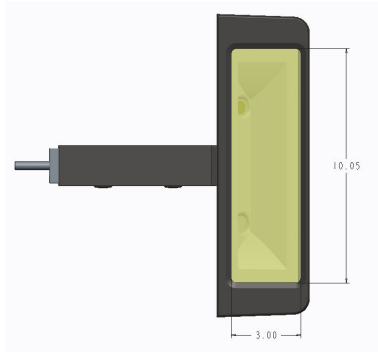


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 20 foot mounting height.



REPORT NUMBER: RAB02587
 ISSUE DATE: 10/17/16 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 10/17/16
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED80Y, WPLED80Y (15 -
 DEGREE UPTILT - STANDARD CUTOFF)
 LUMINAIRE: CAST FINNED METAL HOUSING,
 2-PIECE EXTRUDED METAL HEAT SINK, 2
 CIRCUIT BOARDS EACH WITH 1 LED,
 MOLDED PLASTIC REFLECTOR WITH
 SPECULAR FINISH AND 1 OPTICAL
 COMPARTMENT WITH 1 APERTURE PER LED,
 CLEAR FLAT GLASS LENS IN CAST BROWN
 PAINTED METAL FRAME.
 LAMPS: TWO WHITE MULTI-CHIP LIGHT
 EMITTING DIODES (LEDs), TILTED
 55-DEGREES FROM VERTICAL BASE-UP
 POSITION.

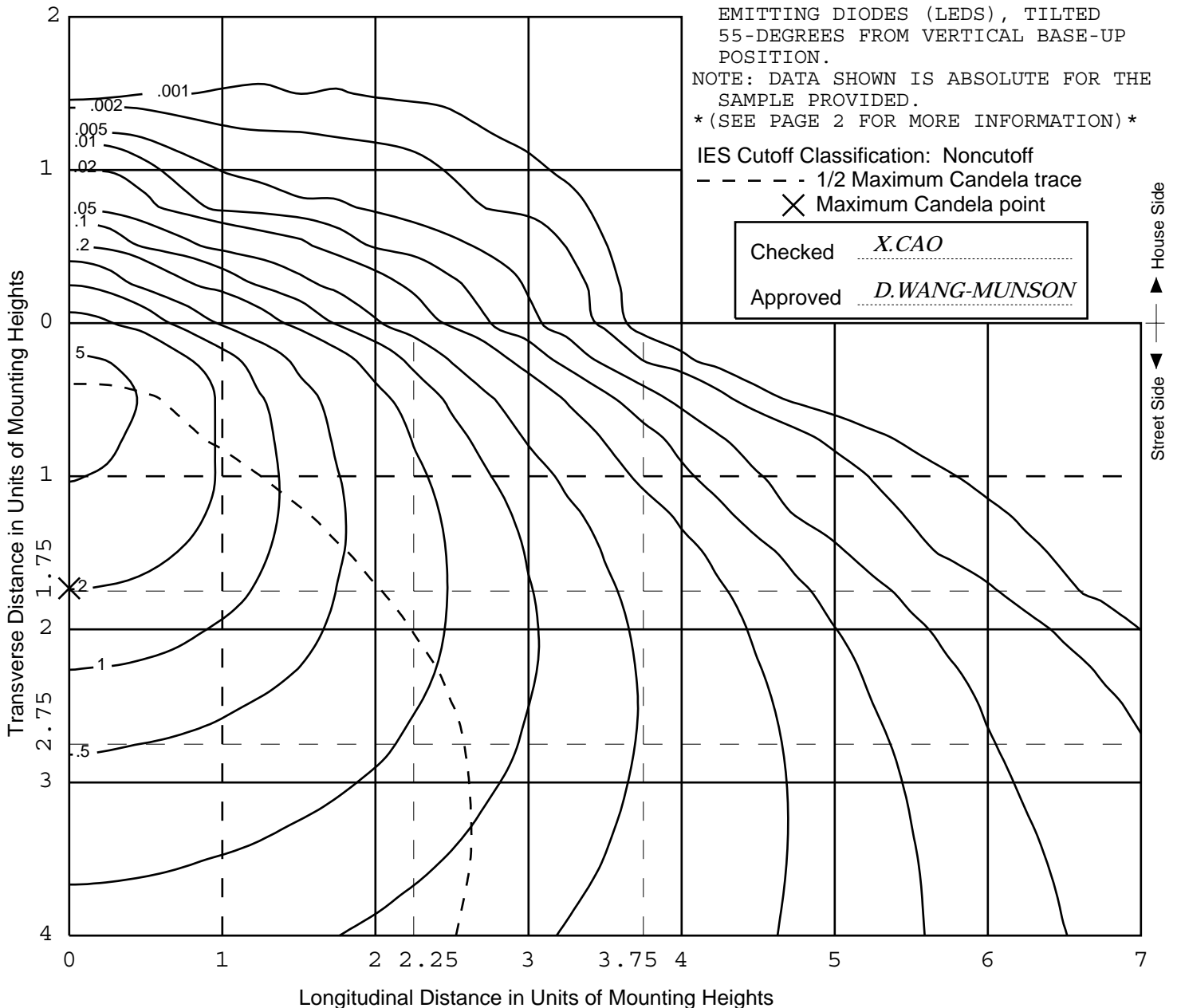
NOTE: DATA SHOWN IS ABSOLUTE FOR THE
 SAMPLE PROVIDED.

(SEE PAGE 2 FOR MORE INFORMATION)

IES Cutoff Classification: Noncutoff

--- 1/2 Maximum Candela trace

X Maximum Candela point



REPORT NUMBER: RAB02587
ISSUE DATE: 10/17/16
PREPARED FOR: RAB LIGHTING INC.

PAGE: 2 OF 9
DATE SAMPLE TESTED: 10/17/16

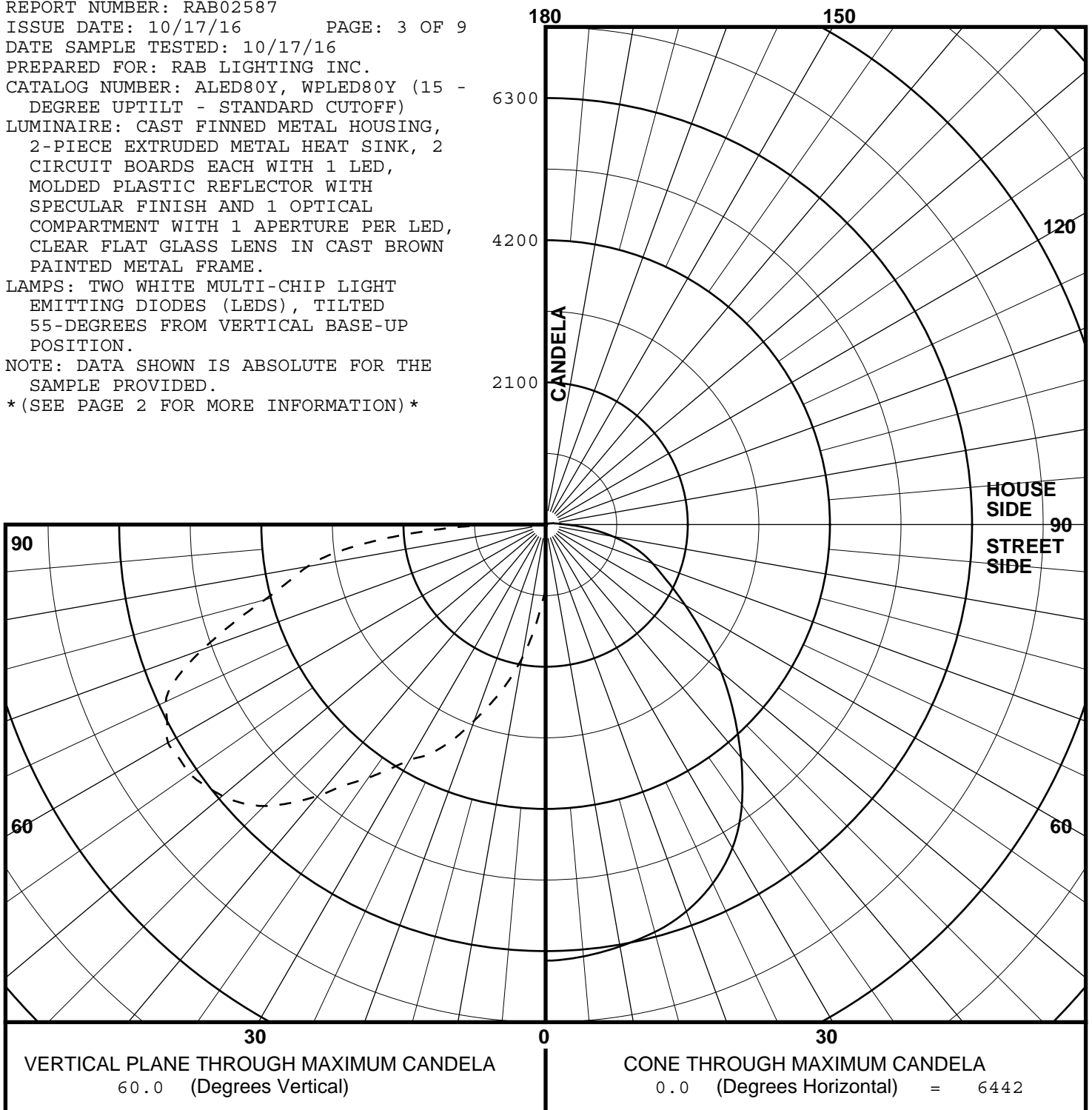
ADDITIONAL INFORMATION

TOTAL INPUT WATTS = 83.021 W AT 120.0 VAC.
LED DRIVER: RD-085-A2000
TEST PROCEDURE: IESNA LM-79-08
ACCREDITED LABORATORY CODE 201058-0

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.

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

REPORT NUMBER: RAB02587
 ISSUE DATE: 10/17/16 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 10/17/16
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED80Y, WPLED80Y (15 -
 DEGREE UPTILT - STANDARD CUTOFF)
 LUMINAIRE: CAST FINNED METAL HOUSING,
 2-PIECE EXTRUDED METAL HEAT SINK, 2
 CIRCUIT BOARDS EACH WITH 1 LED,
 MOLDED PLASTIC REFLECTOR WITH
 SPECULAR FINISH AND 1 OPTICAL
 COMPARTMENT WITH 1 APERTURE PER LED,
 CLEAR FLAT GLASS LENS IN CAST BROWN
 PAINTED METAL FRAME.
 LAMPS: TWO WHITE MULTI-CHIP LIGHT
 EMITTING DIODES (LEDs), TILTED
 55-DEGREES FROM VERTICAL BASE-UP
 POSITION.
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE
 SAMPLE PROVIDED.
 (SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB02587

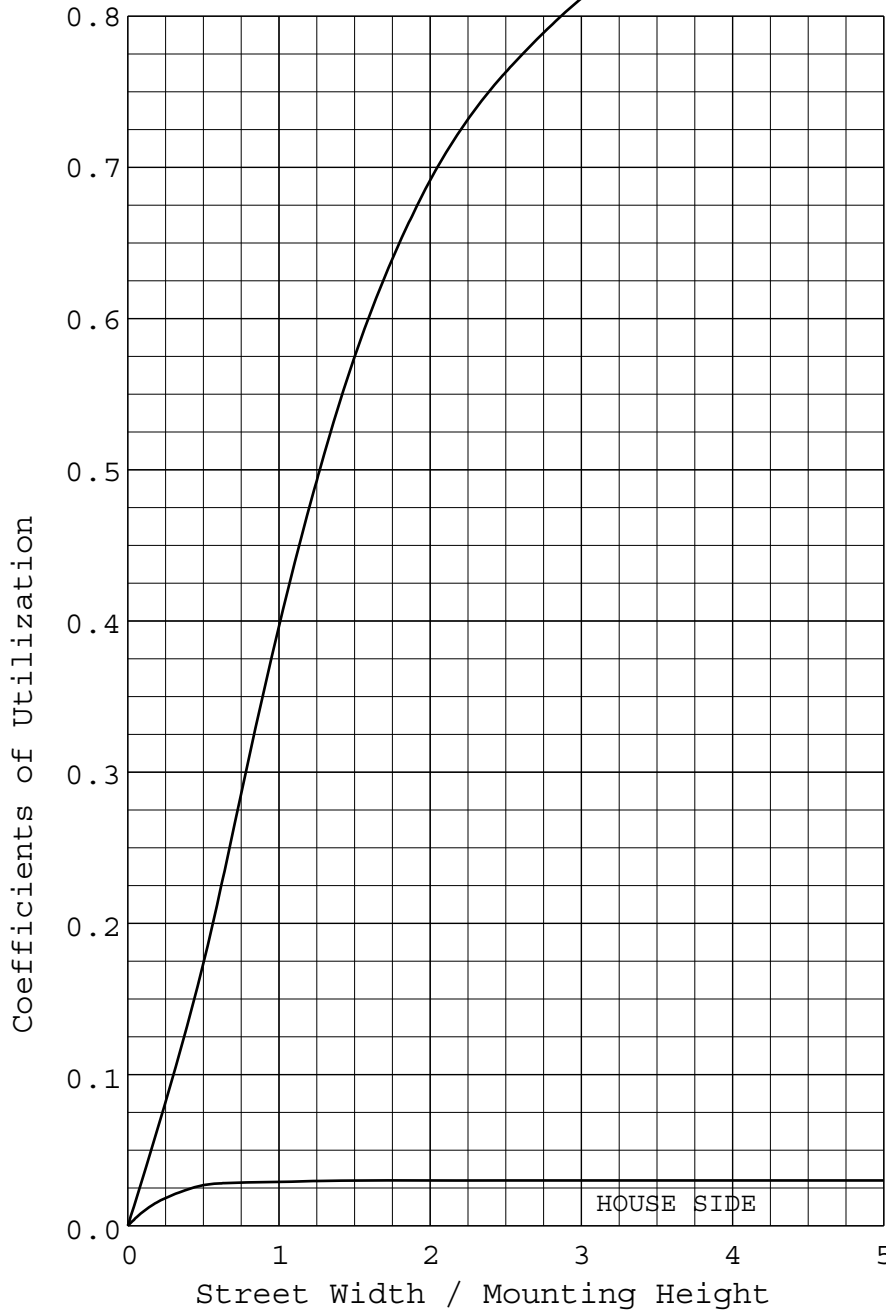
ISSUE DATE: 10/17/16

PREPARED FOR: RAB LIGHTING INC. STREET SIDE

PAGE: 4 OF 9

DATE SAMPLE TESTED: 10/17/16

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	8822.	95.9
DOWNWARD HOUSE SIDE	283.	3.1
DOWNWARD TOTAL	9105.	99.0
UPWARD STREET SIDE	60.	0.7
UPWARD HOUSE SIDE	36.	0.4
UPWARD TOTAL	96.	1.0
TOTAL FLUX	9201.	100.0

TOTAL INPUT WATTS = 83.0
EFFICACY = 110.9 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: RAB02587
 ISSUE DATE: 10/17/16
 PREPARED FOR: RAB LIGHTING INC.

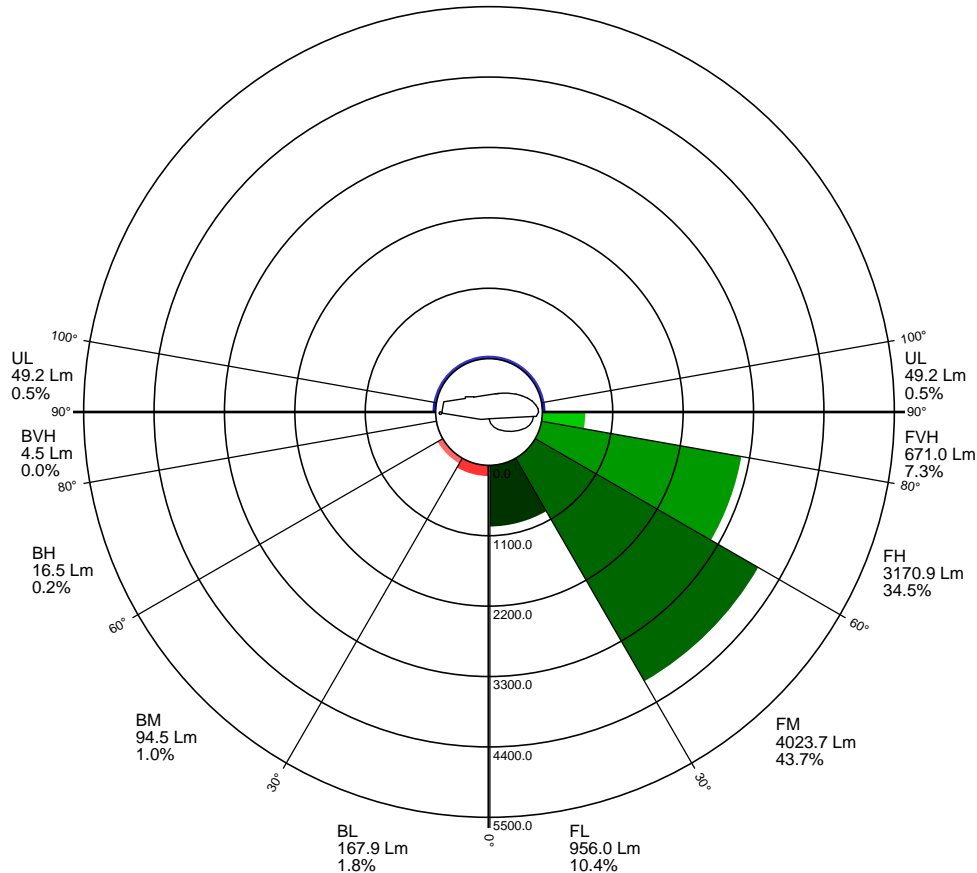
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 10/17/16

BUG Rating:				B1	U2	G4
Zonal Summary				Zone Ratings		
		Lumens	% of Fixture	B	U	G
Forward		8822	95.9			
FL	(0° - 30°)	956.0	10.4			
FM	(30° - 60°)	4023.7	43.7			
FH	(60° - 80°)	3170.9	34.5			G2
FVH	(80° - 90°)	671.0	7.3			G4
Backward		283	3.1			
BL	(0° - 30°)	167.9	1.8	B1		
BM	(30° - 60°)	94.5	1.0	B0		
BH	(60° - 80°)	16.5	0.2	B0		G0
BVH	(80° - 90°)	4.5	0.0			G0
Upward		96	1.0			
UL	(90° - 100°)	49.2	0.5		U2	
UH	(100° - 180°)	47.3	0.5		U2	
Trapped Light		0	0.0			
Total Flux		9201	100.0			

Zonal Lumen Summary

(Linear scale)

UH
47.3 Lm
0.5%

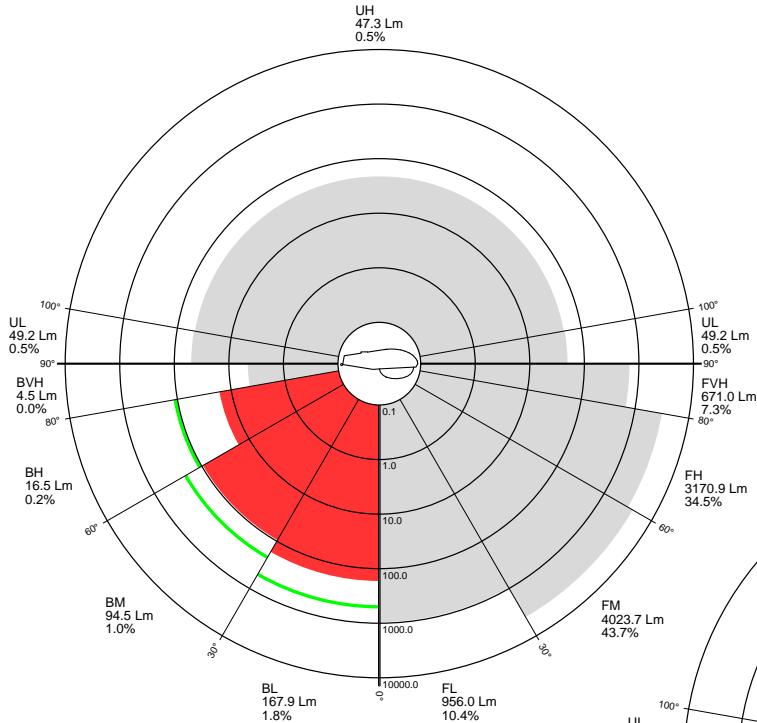


REPORT NUMBER: RAB02587
 ISSUE DATE: 10/17/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 6 OF 9
 DATE SAMPLE TESTED: 10/17/16

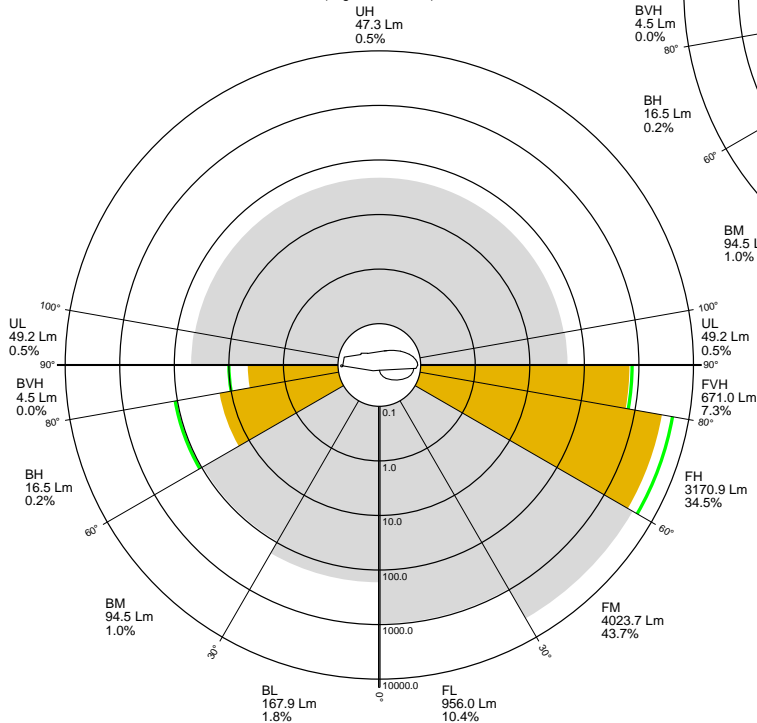
Backlight Rating Details

(Logarithmic scale)



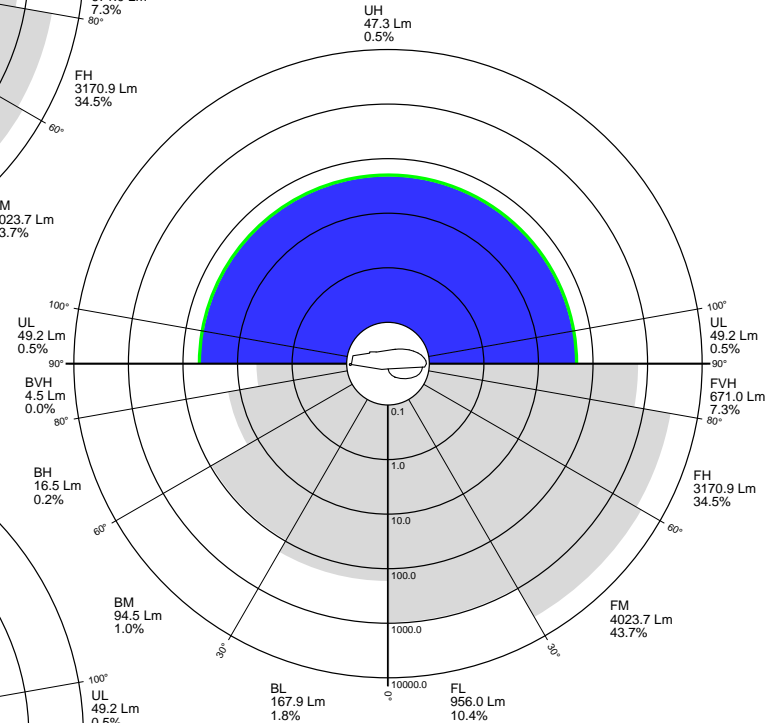
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB02587
 ISSUE DATE: 10/17/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9
 DATE SAMPLE TESTED: 10/17/16

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	7.	7.	7.	7.	7.	7.	7.	7.	7.
	175.0	0.	1.	2.	4.	6.	7.	9.	10.	11. 12.
	165.0	0.	1.	2.	4.	6.	7.	9.	10.	12. 13.
	155.0	0.	1.	2.	4.	6.	7.	9.	10.	12. 13.
	145.0	0.	1.	2.	4.	6.	7.	9.	10.	11. 12.
	135.0	0.	1.	2.	4.	5.	7.	8.	10.	11. 12.
	125.0	0.	1.	2.	4.	6.	7.	8.	10.	11. 12.
	115.0	0.	1.	2.	4.	6.	7.	8.	10.	11. 11.
	105.0	0.	1.	2.	4.	5.	7.	8.	10.	11. 12.
	95.0	88.	81.	71.	47.	24.	12.	9.	9.	10. 11.
	90.0	766.	734.	743.	692.	555.	332.	148.	64.	11. 11.
	87.5	1572.	1528.	1529.	1454.	1255.	878.	411.	187.	30. 11.
	85.0	2388.	2342.	2308.	2174.	1936.	1505.	776.	286.	58. 11.
V	82.5	3108.	3089.	2998.	2798.	2497.	1946.	1150.	494.	110. 12.
E	80.0	3573.	3538.	3392.	3142.	2829.	2306.	1591.	823.	173. 12.
R	77.5	3892.	3876.	3715.	3518.	3233.	2741.	2007.	1123.	297. 16.
T	75.0	4300.	4262.	4121.	3969.	3747.	3128.	2330.	1367.	470. 60.
I	72.5	4842.	4781.	4637.	4486.	4275.	3459.	2503.	1562.	648. 154.
C	70.0	5395.	5321.	5176.	5012.	4741.	3636.	2641.	1705.	841. 267.
A	67.5	5887.	5842.	5704.	5459.	4908.	3781.	2743.	1803.	1021. 374.
L	65.0	6191.	6167.	5970.	5616.	5049.	3874.	2812.	1865.	1188. 474.
	62.5	6305.	6266.	6117.	5809.	5078.	3920.	2849.	1913.	1303. 563.
A	60.0<<	6442.	6402.	6231.	5845.	5054.	3927.	2858.	1986.	1383. 632.
N	57.5	6422.	6404.	6234.	5816.	4984.	3893.	2833.	2078.	1436. 690.
G	55.0	6417.	6391.	6171.	5706.	4859.	3820.	2796.	2158.	1469. 739.
L	52.5	6337.	6308.	6060.	5555.	4742.	3709.	2782.	2222.	1503. 782.
E	50.0	6234.	6190.	5911.	5384.	4601.	3601.	2849.	2274.	1530. 815.
	47.5	6088.	6038.	5740.	5195.	4414.	3481.	2929.	2306.	1555. 840.
	45.0	5878.	5813.	5496.	4963.	4240.	3459.	2989.	2318.	1577. 857.
	42.5	5577.	5529.	5210.	4709.	4071.	3485.	3014.	2313.	1594. 868.
	40.0	5230.	5198.	4912.	4446.	3990.	3493.	3000.	2293.	1614. 887.
	37.5	4845.	4826.	4604.	4265.	3907.	3468.	2942.	2275.	1628. 915.
	35.0	4564.	4542.	4387.	4104.	3810.	3415.	2866.	2247.	1636. 945.
	30.0	4014.	4018.	3957.	3821.	3578.	3155.	2654.	2158.	1617. 1006.
	25.0	3629.	3639.	3589.	3420.	3153.	2788.	2420.	2002.	1544. 1037.
	20.0	3082.	3095.	3072.	2915.	2705.	2453.	2156.	1819.	1449. 1051.
	15.0	2554.	2566.	2568.	2444.	2274.	2081.	1872.	1609.	1323. 1042.
	10.0	2005.	2024.	2014.	1938.	1817.	1690.	1562.	1372.	1194. 1022.
	5.0	1424.	1437.	1449.	1395.	1336.	1286.	1226.	1139.	1069. 991.
	0.0	959.	959.	959.	959.	959.	959.	959.	959.	959.

||
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB02587
 ISSUE DATE: 10/17/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 10/17/16

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	7.	7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
175.0	12.	12.	12.	11.	10.	8.	7.	5.	4.	3.	3.
165.0	13.	13.	13.	12.	10.	9.	8.	7.	6.	6.	6.
155.0	13.	13.	13.	12.	11.	10.	9.	8.	8.	8.	8.
145.0	13.	13.	13.	12.	11.	10.	10.	10.	10.	10.	10.
135.0	12.	13.	12.	12.	11.	10.	10.	10.	11.	11.	11.
125.0	12.	12.	12.	11.	11.	10.	11.	11.	12.	12.	12.
115.0	12.	12.	12.	12.	11.	12.	12.	13.	14.	14.	14.
105.0	12.	12.	12.	12.	12.	12.	13.	14.	15.	15.	15.
95.0	11.	11.	12.	12.	11.	11.	12.	12.	12.	12.	12.
90.0	10.	11.	11.	11.	10.	10.	9.	10.	10.	10.	10.
87.5	11.	10.	10.	10.	10.	9.	9.	8.	8.	8.	8.
85.0	11.	10.	10.	10.	9.	9.	8.	7.	6.	6.	6.
V 82.5	11.	10.	9.	9.	8.	8.	7.	6.	4.	4.	4.
E 80.0	11.	10.	9.	8.	7.	7.	6.	5.	3.	2.	1.
R 77.5	11.	10.	9.	8.	7.	6.	5.	4.	2.	1.	0.
T 75.0	13.	11.	13.	9.	7.	5.	4.	3.	1.	0.	0.
I 72.5	59.	49.	20.	11.	6.	5.	4.	2.	1.	0.	0.
C 70.0	101.	75.	22.	15.	7.	5.	3.	2.	0.	0.	0.
A 67.5	145.	101.	26.	18.	8.	5.	3.	2.	0.	0.	0.
L 65.0	203.	127.	31.	18.	10.	5.	3.	1.	0.	0.	0.
62.5	263.	154.	44.	17.	11.	6.	4.	2.	0.	0.	0.
A 60.0<<	311.	173.	65.	17.	12.	7.	4.	2.	0.	0.	0.
N 57.5	352.	184.	87.	19.	12.	8.	5.	4.	2.	0.	0.
G 55.0	389.	196.	106.	23.	12.	10.	7.	5.	3.	1.	1.
L 52.5	423.	211.	122.	28.	13.	11.	9.	8.	7.	5.	5.
E 50.0	460.	226.	138.	41.	15.	12.	13.	13.	14.	12.	12.
47.5	488.	246.	155.	66.	20.	15.	16.	18.	19.	18.	18.
45.0	513.	264.	167.	94.	31.	19.	20.	22.	25.	24.	24.
42.5	533.	282.	178.	119.	45.	26.	23.	25.	28.	28.	29.
40.0	553.	303.	192.	138.	70.	37.	29.	28.	29.	31.	30.
37.5	584.	334.	209.	155.	99.	48.	37.	32.	32.	33.	33.
35.0	628.	377.	229.	172.	126.	70.	49.	40.	36.	35.	36.
30.0	726.	491.	290.	223.	181.	146.	107.	74.	63.	61.	61.
25.0	807.	602.	373.	327.	269.	240.	220.	193.	171.	151.	152.
20.0	874.	706.	483.	416.	381.	341.	329.	315.	311.	300.	304.
15.0	915.	791.	588.	490.	471.	460.	428.	418.	417.	413.	415.
10.0	939.	859.	712.	603.	543.	514.	506.	507.	507.	507.	507.
5.0	952.	913.	843.	780.	727.	684.	649.	623.	615.	599.	599.
0.0	959.	959.	959.	959.	959.	959.	959.	959.	959.	959.	959.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB02587
 ISSUE DATE: 10/17/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
 DATE SAMPLE TESTED: 10/17/16

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	23
5- 10	75
10- 15	140
15- 20	214
20- 25	294
25- 30	378
30- 35	464
35- 40	553
40- 45	649
45- 50	742
50- 55	822
55- 60	888
60- 65	917
65- 70	887
70- 75	770
75- 80	613
80- 85	450
85- 90	225
90- 95	42
95-100	7
100-105	5
105-110	5
110-115	5
115-120	5
120-125	4
125-130	4
130-135	4
135-140	3
140-145	3
145-150	3
150-155	2
155-160	2
160-165	1
165-170	1
170-175	1
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	98
0- 20	451
0- 30	1124
0- 40	2141
0- 50	3532
0- 60	5242
0- 70	7046
0- 80	8429
0- 90	9105
0-100	9154
0-110	9164
0-120	9174
0-130	9182
0-140	9189
0-150	9194
0-160	9198
0-170	9201
0-180	9201

REPORT NUMBER: RAB02590
 DATE: 10/18/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED80Y, WPLED80Y (15 - DEGREE UPTILT - STANDARD CUTOFF)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED METAL HOUSING, 2-PIECE EXTRUDED METAL HEAT SINK, 2 CIRCUIT BOARDS EACH WITH 1 LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 OPTICAL COMPARTMENT WITH 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL FRAME.

LAMP: TWO WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), TILTED 55-DEGREES FROM VERTICAL BASE-UP POSITION.

DRIVER: RD-085-A2000

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: N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	2/26/17
	OCEAN OPTICS QE65PRO Spectroradiometer	10/18/17
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	10/18/17

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 X.CAO

Approved D.WANG-MUNSON
 Lighting Engineer

REPORT NUMBER: RAB02590
 DATE: 10/18/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED80Y, WPLED80Y (15 - DEGREE UPTILT - STANDARD CUTOFF)

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	9201 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4312
Chromaticity Ordinate y	0.4042
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2469
Chromaticity Ordinate v'	0.5206
Correlated Color Temp CCT (K)	3099
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	26073 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.695
Input Power (Watts)	83.0
Input Power Factor (%)	99.6
Input Current THD (%)	5.4
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	110.9
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.314
Input Power (Watts)	81.1
Input Power Factor (%)	93.2
Input Current THD (%)	12.1
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	71
R1 Light greyish red	67
R2 Dark greyish yellow	80
R3 Strong yellowish green	91
R4 Moderate yellowish green	67
R5 Light bluish green	66
R6 Light blue	72
R7 Light violet	79
R8 Light reddish purple	45
R9 Strong red	-33
R10 Strong yellow	53
R11 Strong green	60
R12 Strong blue	43
R13 Light yellowish pink (skin)	69
R14 Moderate olive green (leaf)	95

*NOTE:

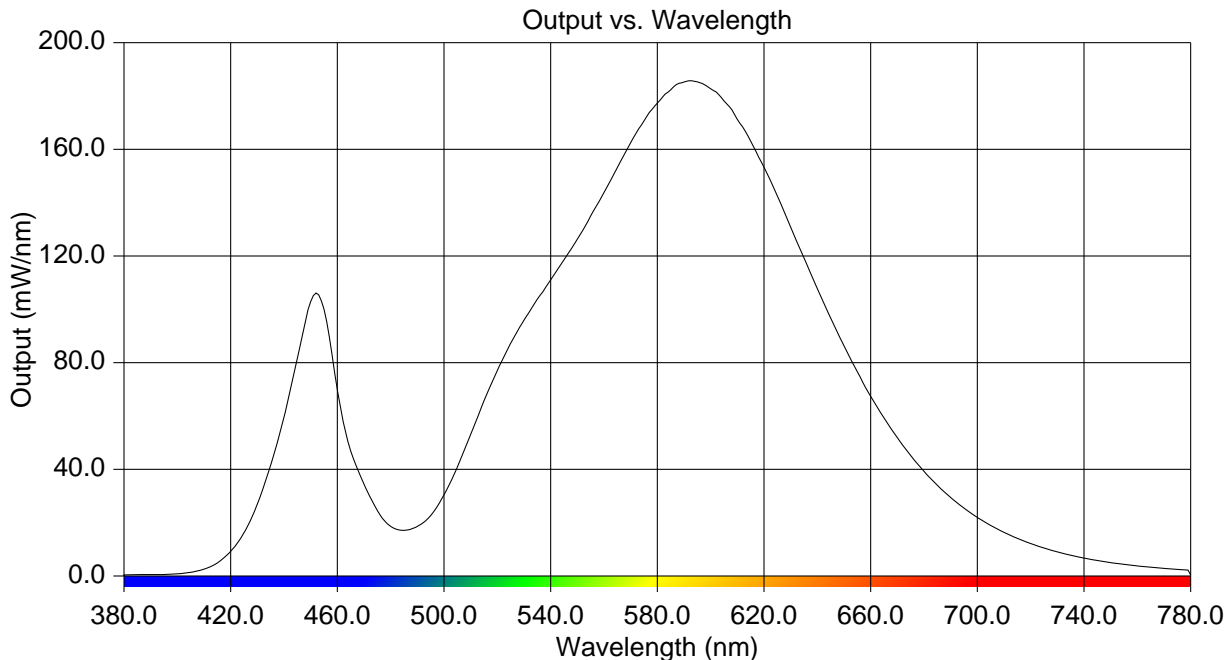
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB02590
 DATE: 10/18/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED80Y, WPLED80Y (15 - DEGREE UPTILT - STANDARD CUTOFF)

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.397	515	65.714	650	86.251
385	0.444	520	77.142	655	76.595
390	0.488	525	87.266	660	67.496
395	0.599	530	96.019	665	59.235
400	0.816	535	103.831	670	51.786
405	1.354	540	111.189	675	45.188
410	2.526	545	118.567	680	39.193
415	4.883	550	126.201	685	34.048
420	9.193	555	135.035	690	29.443
425	16.181	560	143.678	695	25.459
430	26.868	565	153.024	700	21.969
435	41.672	570	162.524	705	18.960
440	59.542	575	170.656	710	16.351
445	81.775	580	177.328	715	14.105
450	102.900	585	182.309	720	12.173
455	100.061	590	185.237	725	10.474
460	69.905	595	185.312	730	9.011
465	46.918	600	182.679	735	7.811
470	34.424	605	178.154	740	6.689
475	24.552	610	171.224	745	5.803
480	18.574	615	163.083	750	5.025
485	17.154	620	153.290	755	4.347
490	18.570	625	142.529	760	3.783
495	22.640	630	130.928	765	3.280
500	30.434	635	119.351	770	2.848
505	40.772	640	107.564	775	2.467
510	53.160	645	96.831	780	0.374



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CATALOG NUMBER: ALED80Y, WPLED80Y (15 - DEGREE UPTILT - STANDARD CUTOFF)

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CIE Chromaticity Diagram

