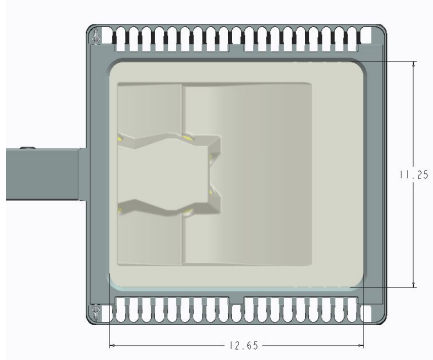
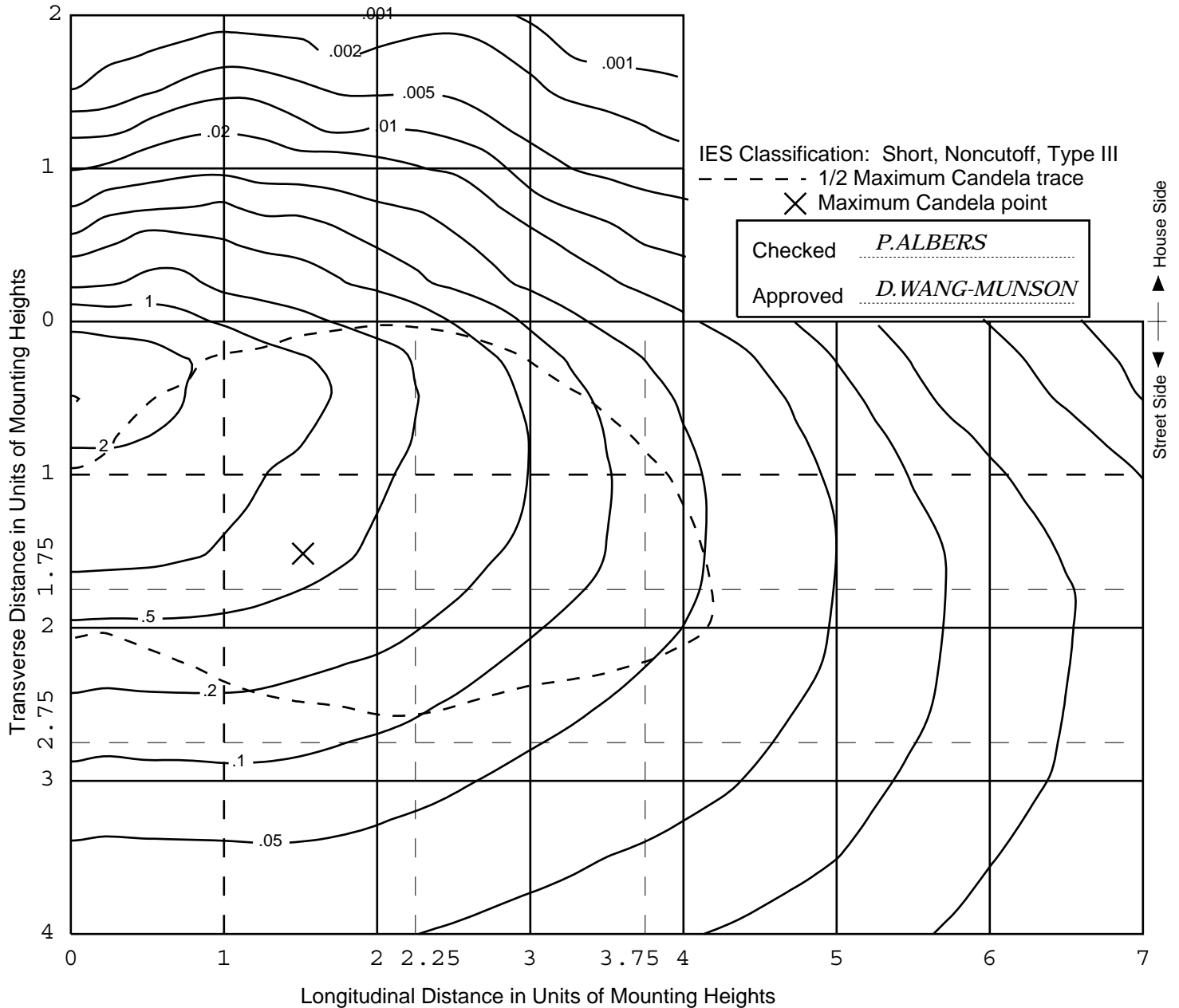


## ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 25 foot mounting height.



REPORT NUMBER: RAB04324  
 ISSUE DATE: 04/27/18 PAGE: 1 OF 9  
 DATE SAMPLE TESTED: 04/27/18  
 PREPARED FOR: RAB LIGHTING INC. RC  
 LIGHTING  
 CATALOG NUMBER: ALED3T78Y - RWLED3T78Y  
 - RWLED3T78SFY - WPLED3T78Y (TYPE  
 III)  
 LUMINAIRE: CAST FINNED METAL HOUSING, 6  
 CIRCUIT BOARDS EACH WITH 1 LED,  
 MOLDED PLASTIC REFLECTOR WITH  
 SPECULAR FINISH AND 1 APERTURE PER  
 LED, CLEAR FLAT GLASS LENS IN CAST  
 BROWN PAINTED METAL LENS FRAME.  
 \*(SEE PAGE 2 FOR MORE INFORMATION)\*



REPORT NUMBER: RAB04324

PAGE: 2 OF 9

ISSUE DATE: 04/27/18

DATE SAMPLE TESTED: 04/27/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

ADDITIONAL INFORMATION

LAMPS: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), 2 LEDs TILTED 63-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 75-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 67-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 68-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 58-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 40-DEGREES FROM STRAIGHT AHEAD.

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.

TOTAL INPUT WATTS = 78.193 W AT 120.0 VAC.

LED DRIVER: RDD-U85-A2100

TEST PROCEDURE: IESNA LM-79-08

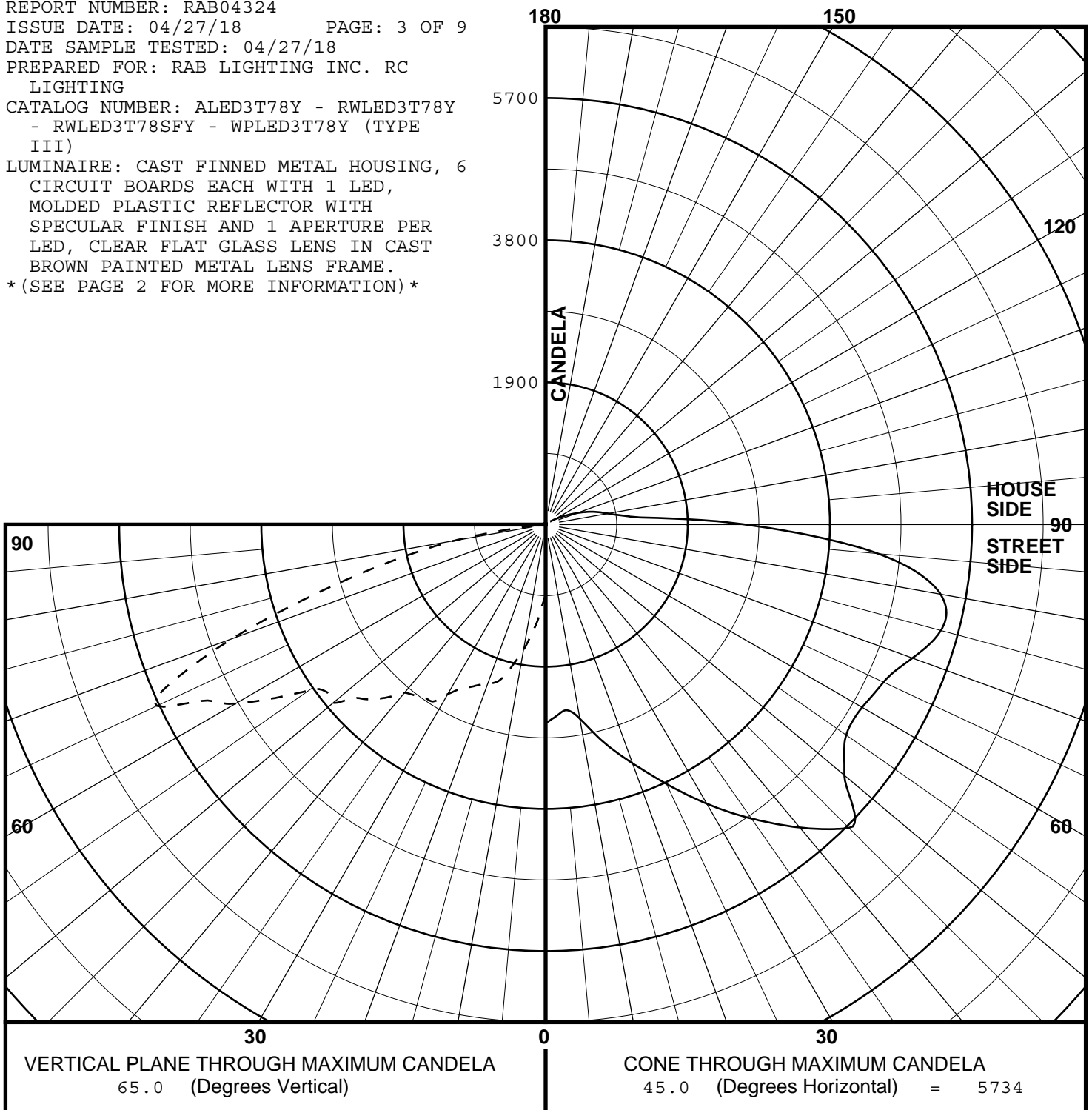
LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE

AMBIENT: 24.6

ACCREDITED LABORATORY CODE 201058-0

## MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

REPORT NUMBER: RAB04324  
 ISSUE DATE: 04/27/18 PAGE: 3 OF 9  
 DATE SAMPLE TESTED: 04/27/18  
 PREPARED FOR: RAB LIGHTING INC. RC  
 LIGHTING  
 CATALOG NUMBER: ALED3T78Y - RWLED3T78Y  
 - RWLED3T78SFY - WPLED3T78Y (TYPE  
 III)  
 LUMINAIRE: CAST FINNED METAL HOUSING, 6  
 CIRCUIT BOARDS EACH WITH 1 LED,  
 MOLDED PLASTIC REFLECTOR WITH  
 SPECULAR FINISH AND 1 APERTURE PER  
 LED, CLEAR FLAT GLASS LENS IN CAST  
 BROWN PAINTED METAL LENS FRAME.  
 \*(SEE PAGE 2 FOR MORE INFORMATION)\*



REPORT NUMBER: RAB04324

PAGE: 4 OF 9

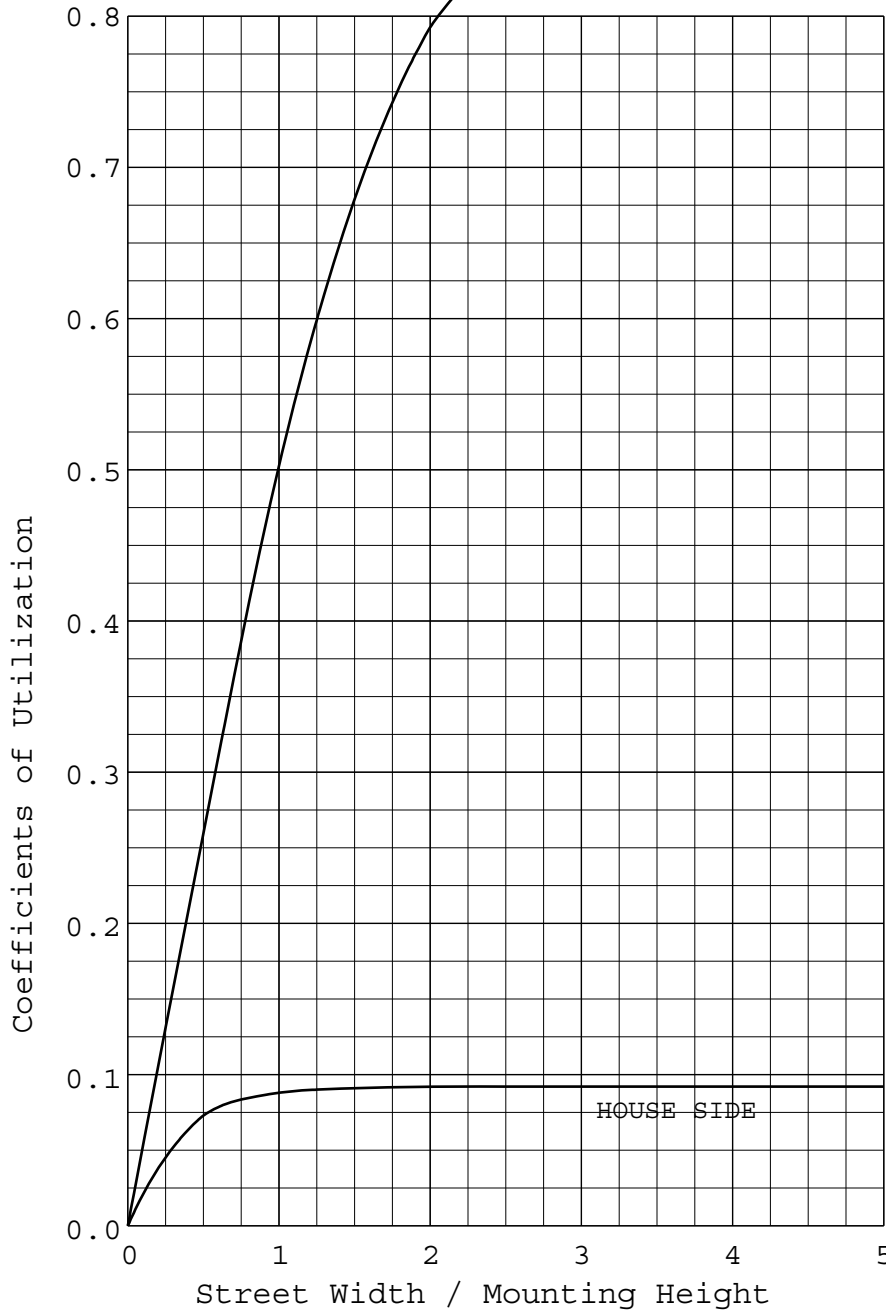
ISSUE DATE: 04/27/18

STREET SIDE

DATE SAMPLE TESTED: 04/27/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

# COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	8182.	90.7
DOWNWARD HOUSE SIDE	838.	9.3
DOWNWARD TOTAL	9020.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	9020.	100.0

TOTAL INPUT WATTS = 78.2  
EFFICACY = 115.3 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: RAB04324

ISSUE DATE: 04/27/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 5 OF 9

DATE SAMPLE TESTED: 04/27/18

BUG Rating:

Zonal Summary

Lumens

% of Fixture

B1 U0 G2

Zone Ratings

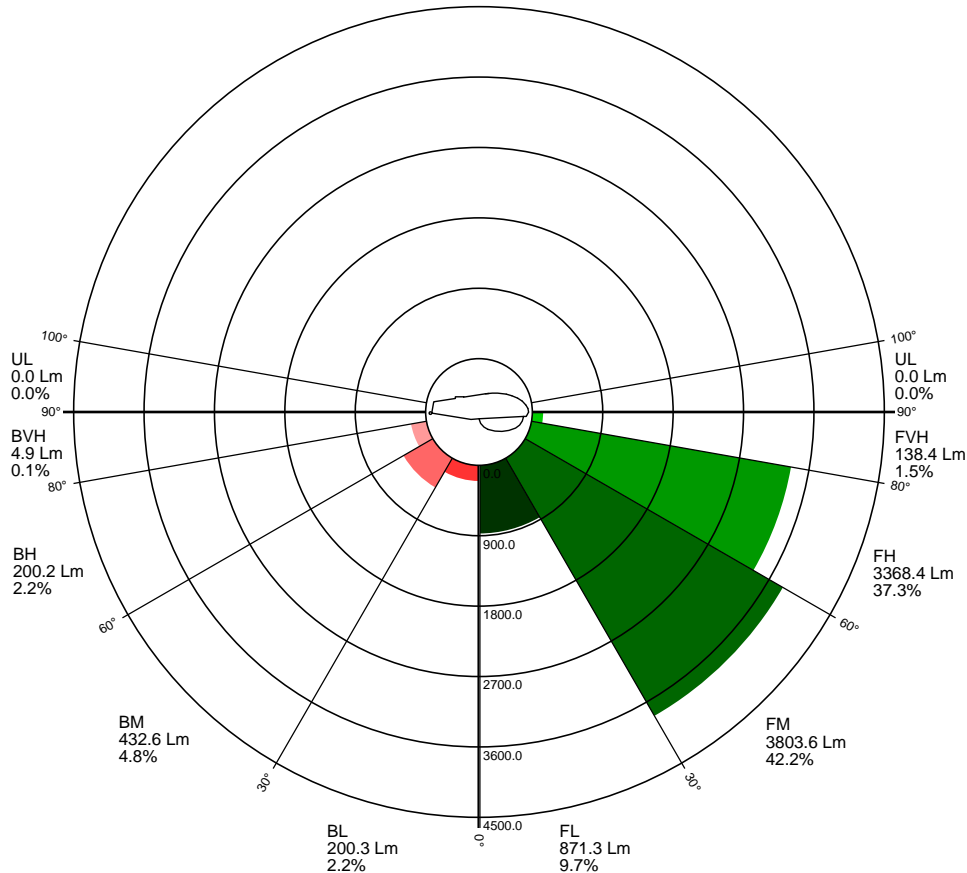
B U G

Forward		8182	90.7			
FL	(0° - 30°)	871.3	9.7			
FM	(30° - 60°)	3803.6	42.2			
FH	(60° - 80°)	3368.4	37.3			G2
FVH	(80° - 90°)	138.4	1.5			G2
Backward		838	9.3			
BL	(0° - 30°)	200.3	2.2	B1		
BM	(30° - 60°)	432.6	4.8	B1		
BH	(60° - 80°)	200.2	2.2	B1		G1
BVH	(80° - 90°)	4.9	0.1			G0
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		9020	100.0			

### Zonal Lumen Summary

(Linear scale)

UH  
0.0 Lm  
0.0%



REPORT NUMBER: RAB04324

ISSUE DATE: 04/27/18

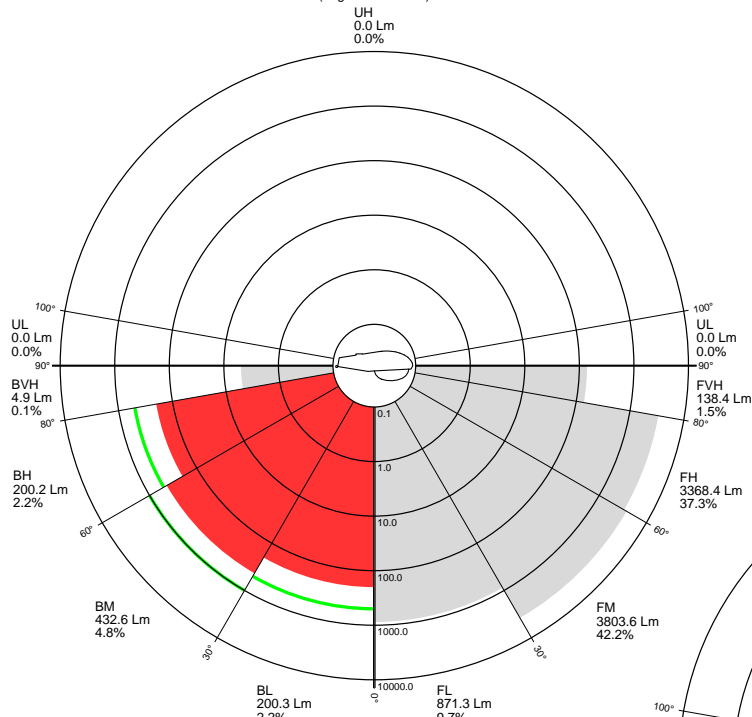
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 6 OF 9

DATE SAMPLE TESTED: 04/27/18

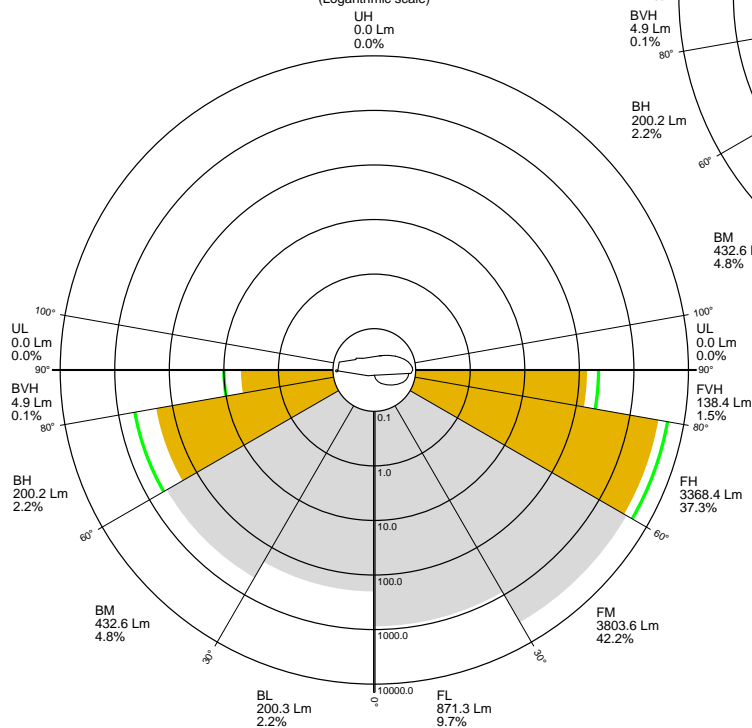
## Backlight Rating Details

(Logarithmic scale)



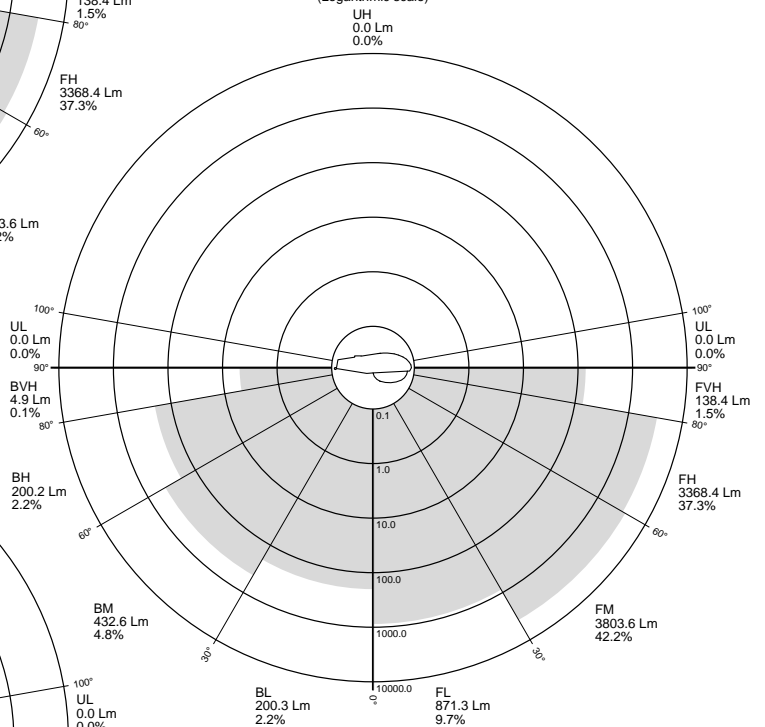
## Glare Rating Details

(Logarithmic scale)



## Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB04324

PAGE: 7 OF 9

ISSUE DATE: 04/27/18

DATE SAMPLE TESTED: 04/27/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

### 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	0.	0.	0.	0.	0.	0.	0.	0.	0.
	175.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	165.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	2.	2.	4.	4.	8.	10.	12.	13.	14. 8.
	85.0	16.	14.	34.	51.	86.	118.	153.	165.	157. 22.
V	82.5	50.	75.	193.	230.	353.	474.	796.	922.	759. 135.
E	80.0	170.	222.	393.	579.	826.	1240.	1757.	1814.	1462. 553.
R	77.5	606.	623.	842.	1251.	1504.	1881.	2492.	3035.	2460. 1406.
T	75.0	1145.	1117.	1339.	1805.	2223.	2611.	3177.	4005.	3267. 2096.
I	72.5	1519.	1474.	1713.	2240.	2739.	3486.	4188.	4897.	4199. 2608.
C	70.0	1832.	1768.	2076.	2696.	3304.	4459.	5385.	5168.	5086. 3394.
A	67.5	2215.	2092.	2497.	3225.	4066.	5313.	5424.	5149.	5212. 4317.
L	65.0<<	2653.	2512.	3015.	3824.	4795.	5734.	4904.	4984.	5470. 4464.
	62.5	3221.	3117.	3696.	4475.	5376.	5092.	4923.	4718.	5455. 4321.
A	60.0	4087.	3993.	4466.	5182.	5094.	4787.	4521.	4798.	5179. 4044.
N	57.5	4739.	4703.	4855.	4964.	4419.	4323.	4246.	5345.	4724. 3721.
G	55.0	4451.	4465.	4273.	4057.	3968.	3863.	4023.	4702.	4223. 3376.
L	52.5	3675.	3706.	3649.	3670.	3486.	3682.	3967.	4085.	3762. 2859.
E	50.0	3322.	3348.	3337.	3242.	3187.	3707.	3825.	3822.	3490. 2427.
	47.5	3098.	3125.	3075.	3031.	3158.	3429.	3463.	3471.	3304. 2285.
	45.0	2916.	2957.	2878.	2911.	3138.	3304.	3225.	3167.	3139. 2134.
	42.5	2803.	2819.	2854.	2990.	3098.	3133.	3081.	2990.	2907. 1965.
	40.0	2816.	2806.	2820.	2866.	2998.	2930.	2857.	2803.	2767. 1821.
	37.5	2591.	2594.	2674.	3076.	2834.	2876.	2657.	2635.	2544. 1732.
	35.0	2716.	2727.	2859.	2803.	2853.	2825.	2609.	2595.	2340. 1647.
	30.0	2766.	2746.	2724.	2743.	2709.	2617.	2513.	2508.	2248. 1545.
	25.0	2893.	2871.	2646.	2541.	2455.	2397.	2355.	2287.	1845. 1340.
	20.0	2617.	2636.	2506.	2391.	2294.	2267.	2203.	1962.	1584. 1175.
	15.0	2353.	2351.	2347.	2248.	2167.	2078.	1914.	1631.	1309. 1034.
	10.0	2109.	2099.	2094.	2008.	1853.	1703.	1508.	1344.	1134. 965.
	5.0	1502.	1514.	1462.	1445.	1373.	1304.	1200.	1105.	1013. 939.
	0.0	938.	938.	938.	938.	938.	938.	938.	938.	938. 938.

||

PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB04324

PAGE: 8 OF 9

ISSUE DATE: 04/27/18

DATE SAMPLE TESTED: 04/27/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

### 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
V E R T I C A L	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	7.	7.	7.	7.	6.	6.	5.	3.	3.	3.	3.
	85.0	11.	9.	8.	8.	6.	6.	5.	3.	3.	3.	3.
	82.5	71.	28.	16.	11.	7.	5.	4.	3.	3.	3.	3.
	80.0	328.	142.	26.	25.	7.	5.	4.	3.	4.	4.	4.
	77.5	803.	447.	70.	36.	10.	5.	5.	4.	5.	5.	5.
	75.0	1073.	461.	136.	38.	19.	8.	5.	4.	5.	5.	5.
	72.5	1522.	681.	183.	87.	51.	11.	8.	5.	5.	5.	5.
	70.0	2093.	976.	449.	145.	58.	13.	17.	7.	7.	7.	7.
	67.5	2441.	1103.	650.	213.	63.	22.	13.	7.	8.	8.	8.
	65.0<<	2674.	1171.	659.	268.	74.	46.	22.	9.	8.	9.	8.
	62.5	2668.	1260.	682.	339.	94.	65.	43.	16.	10.	8.	8.
	60.0	2386.	1276.	793.	422.	124.	92.	53.	23.	11.	7.	7.
	57.5	2257.	1243.	763.	421.	154.	110.	63.	29.	14.	8.	7.
	55.0	2118.	1271.	708.	413.	184.	120.	72.	38.	17.	8.	8.
	52.5	1927.	1256.	636.	447.	262.	133.	77.	45.	22.	12.	8.
	50.0	1736.	1231.	603.	535.	361.	167.	86.	50.	28.	35.	34.
	47.5	1653.	1182.	620.	449.	357.	184.	101.	56.	34.	36.	63.
	45.0	1625.	1122.	632.	468.	323.	198.	118.	65.	45.	37.	33.
	42.5	1580.	1224.	626.	464.	351.	212.	129.	106.	56.	33.	26.
	40.0	1485.	1272.	724.	463.	373.	227.	142.	98.	79.	52.	35.
	37.5	1418.	1248.	1069.	494.	369.	243.	157.	110.	93.	72.	60.
35.0	1380.	1200.	1048.	762.	428.	319.	176.	119.	98.	75.	65.	
30.0	1271.	1117.	834.	610.	447.	329.	294.	155.	101.	81.	72.	
25.0	1124.	1010.	748.	586.	407.	299.	230.	178.	133.	122.	121.	
20.0	1022.	929.	740.	603.	460.	329.	242.	187.	177.	187.	190.	
15.0	927.	851.	736.	612.	536.	486.	394.	324.	290.	253.	238.	
10.0	889.	827.	731.	668.	600.	549.	509.	480.	436.	407.	401.	
5.0	903.	873.	812.	758.	720.	690.	668.	638.	611.	607.	600.	
0.0	938.	938.	938.	938.	938.	938.	938.	938.	938.	938.	938.	

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB04324

ISSUE DATE: 04/27/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 9 OF 9

DATE SAMPLE TESTED: 04/27/18

### 5-DEGREE ZONAL LUMEN SUMMARY

0- 5	23
5- 10	75
10- 15	138
15- 20	203
20- 25	276
25- 30	357
30- 35	441
35- 40	512
40- 45	597
45- 50	707
50- 55	872
55- 60	1107
60- 65	1174
65- 70	1095
70- 75	829
75- 80	470
80- 85	135
85- 90	8
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	98
0- 20	439
0- 30	1072
0- 40	2025
0- 50	3329
0- 60	5308
0- 70	7577
0- 80	8876
0- 90	9020
0-100	9020
0-110	9020
0-120	9020
0-130	9020
0-140	9020
0-150	9020
0-160	9020
0-170	9020
0-180	9020

REPORT NUMBER: RAB04307  
 DATE: 4/24/2018  
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING  
 CATALOG NUMBER: ALED3T78Y - RWLED3T78Y - RWLED3T78SFY - WPLED3T78Y (TYPE III)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED METAL HOUSING, 6 CIRCUIT BOARDS EACH WITH 1 LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL LENS FRAME.

LAMP: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), 2 LEDs TILTED 63-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 75-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 67-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 68-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 58-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 40-DEGREES FROM STRAIGHT AHEAD.

DRIVER: RDD-U85-A2100

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	3/08/19
	OCEAN OPTICS QE65PRO Spectroradiometer	04/23/19
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	04/23/19

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: RAB04307  
 DATE: 4/24/2018  
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING  
 CATALOG NUMBER: ALED3T78Y - RWLED3T78Y - RWLED3T78SFY - WPLED3T78Y (TYPE III)

Page 2 of 4

### RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	9020 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4334
Chromaticity Ordinate y	0.4052
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2478
Chromaticity Ordinate v'	0.5213
Correlated Color Temp CCT (K)	3068
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	25160 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.655
Input Power (Watts)	78.2
Input Power Factor (%)	99.5
Input Current THD (%)	5.9
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	115.3
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.297
Input Power (Watts)	76.4
Input Power Factor (%)	92.8
Input Current THD (%)	11.9
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	71
R1 Light greyish red	66
R2 Dark greyish yellow	82
R3 Strong yellowish green	95
R4 Moderate yellowish green	69
R5 Light bluish green	68
R6 Light blue	77
R7 Light violet	75
R8 Light reddish purple	38
R9 Strong red	-45
R10 Strong yellow	61
R11 Strong green	66
R12 Strong blue	60
R13 Light yellowish pink (skin)	69
R14 Moderate olive green (leaf)	97

### \*NOTE:

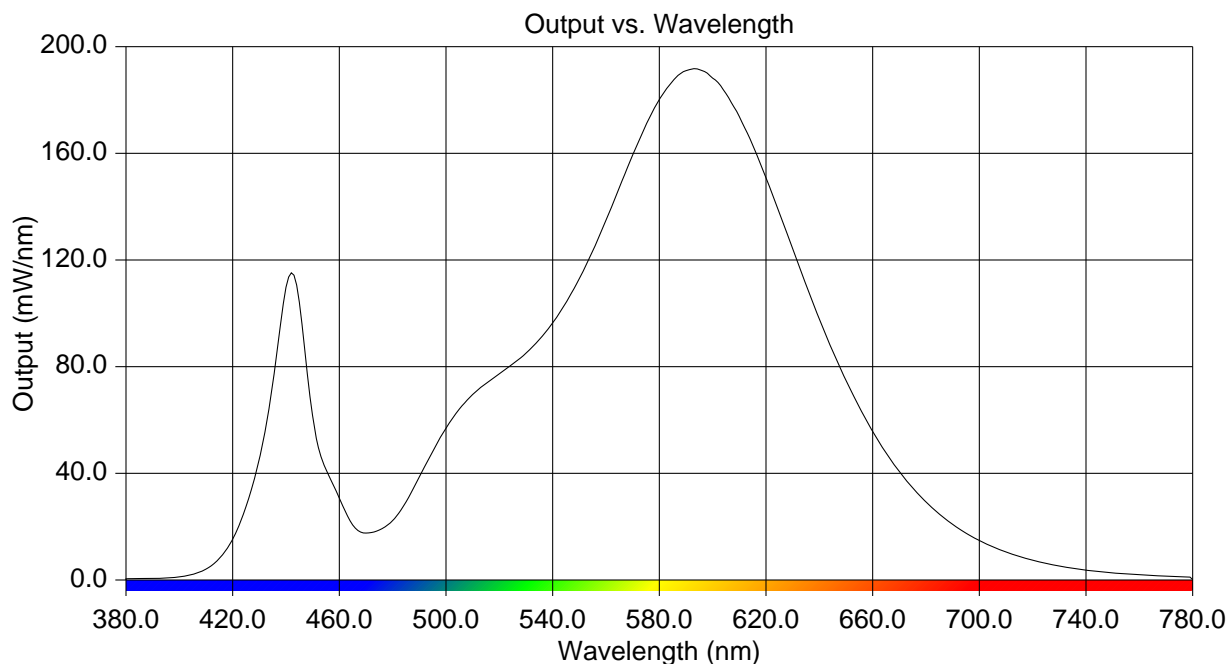
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB04307  
 DATE: 4/24/2018  
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING  
 CATALOG NUMBER: ALED3T78Y - RWLED3T78Y - RWLED3T78SFY - WPLED3T78Y (TYPE III)

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### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.447	515	73.831	650	74.827
385	0.517	520	77.323	655	64.848
390	0.591	525	81.017	660	55.670
395	0.747	530	85.073	665	47.672
400	1.168	535	90.166	670	40.697
405	2.100	540	96.444	675	34.504
410	4.090	545	103.967	680	29.198
415	8.079	550	113.067	685	24.778
420	15.307	555	123.362	690	20.840
425	27.523	560	134.872	695	17.559
430	45.297	565	147.187	700	14.793
435	73.321	570	159.376	705	12.480
440	109.797	575	170.654	710	10.477
445	104.195	580	180.083	715	8.803
450	61.406	585	187.150	720	7.392
455	41.465	590	190.996	725	6.213
460	30.715	595	191.446	730	5.215
465	20.640	600	188.192	735	4.396
470	17.601	605	182.412	740	3.712
475	18.754	610	173.779	745	3.167
480	22.252	615	163.239	750	2.679
485	29.247	620	150.851	755	2.283
490	38.661	625	138.040	760	1.938
495	48.333	630	123.951	765	1.651
500	57.027	635	110.706	770	1.410
505	64.099	640	97.932	775	1.202
510	69.542	645	86.018	780	0.182



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## CIE Chromaticity Diagram

