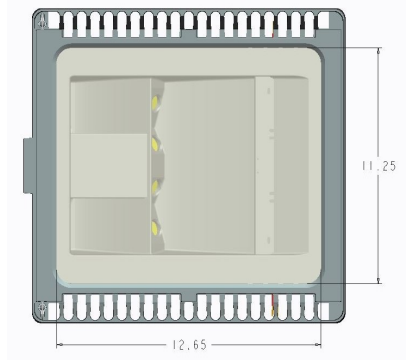
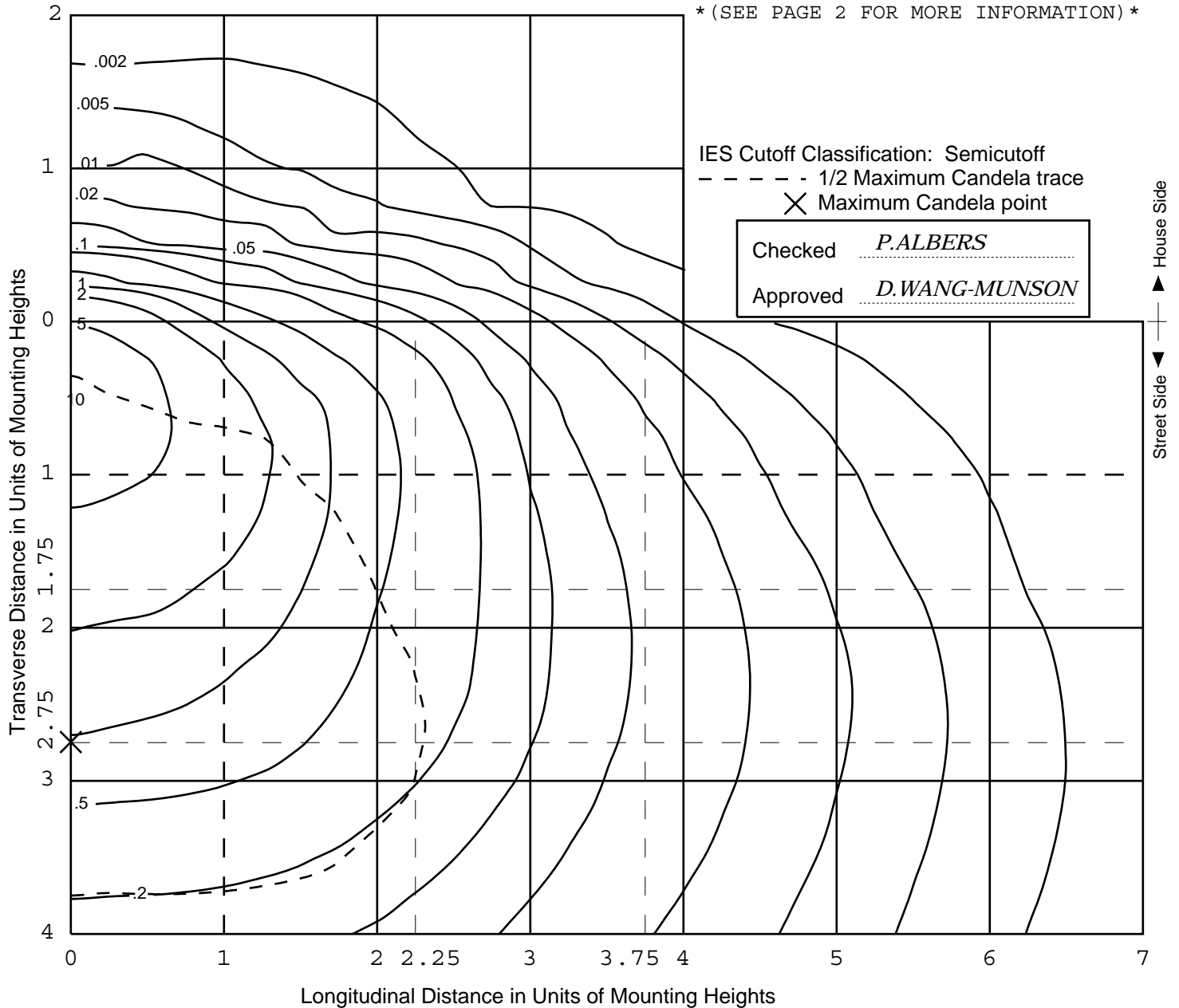


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 25 foot mounting height.



REPORT NUMBER: RAB04284
 ISSUE DATE: 04/18/18 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 04/18/18
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: ALED4T150Y -
 RWLED4T150Y - RWLED4T150SFY -
 WPLED4T150Y (TYPE IV) (ALSO APPLIES TO RCL)
 LUMINAIRE: CAST FINNED METAL HOUSING, 6
 CIRCUIT BOARDS EACH WITH 1 LED,
 MOLDED 2-PIECE 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: RAB04284

PAGE: 2 OF 9

ISSUE DATE: 04/18/18

DATE SAMPLE TESTED: 04/18/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

ADDITIONAL INFORMATION

LAMPS: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), 2 LEDs TILTED 56-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 18-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 57-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 16-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 57-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 22-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 = 156.73 W AT 120.0 VAC.

LED DRIVER: RDD-160

TEST PROCEDURE: IESNA LM-79-08

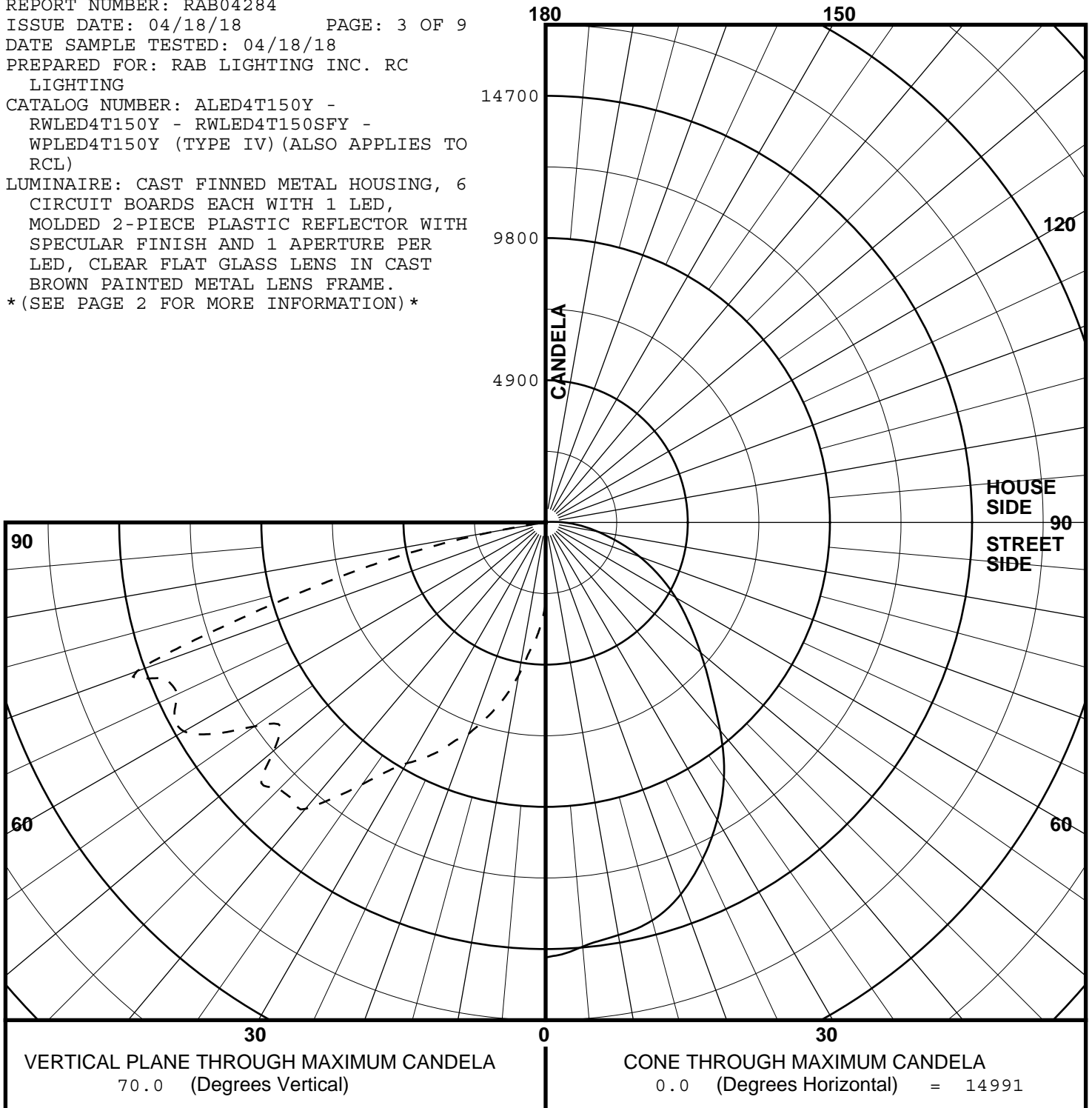
LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE

AMBIENT: 25.1

ACCREDITED LABORATORY CODE 201058-0

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

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 ISSUE DATE: 04/18/18 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 04/18/18
 PREPARED FOR: RAB LIGHTING INC. RC
 LIGHTING
 CATALOG NUMBER: ALED4T150Y -
 RWLED4T150Y - RWLED4T150SFY -
 WPLED4T150Y (TYPE IV) (ALSO APPLIES TO
 RCL)
 LUMINAIRE: CAST FINNED METAL HOUSING, 6
 CIRCUIT BOARDS EACH WITH 1 LED,
 MOLDED 2-PIECE 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)



STREET SIDE

REPORT NUMBER: RAB04284

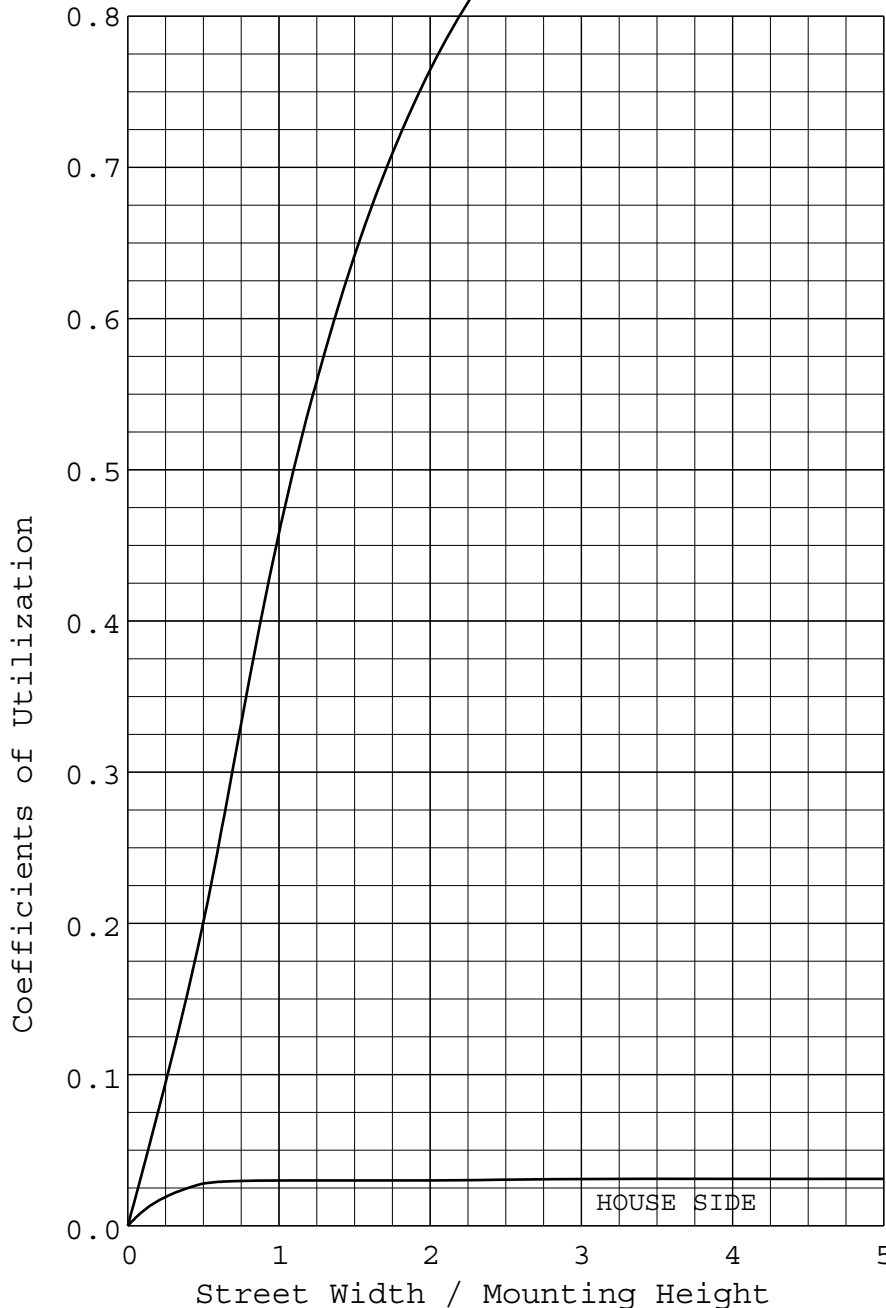
ISSUE DATE: 04/18/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 4 OF 9

DATE SAMPLE TESTED: 04/18/18

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	18326.	96.8
DOWNWARD HOUSE SIDE	602.	3.2
DOWNWARD TOTAL	18927.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	18927.	100.0
TOTAL INPUT WATTS = 156.7		
EFFICACY = 120.8 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: RAB04284

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PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

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DATE SAMPLE TESTED: 04/18/18

BUG Rating:

Zonal Summary

Lumens

% of Fixture

B1 U0 G3

Zone Ratings

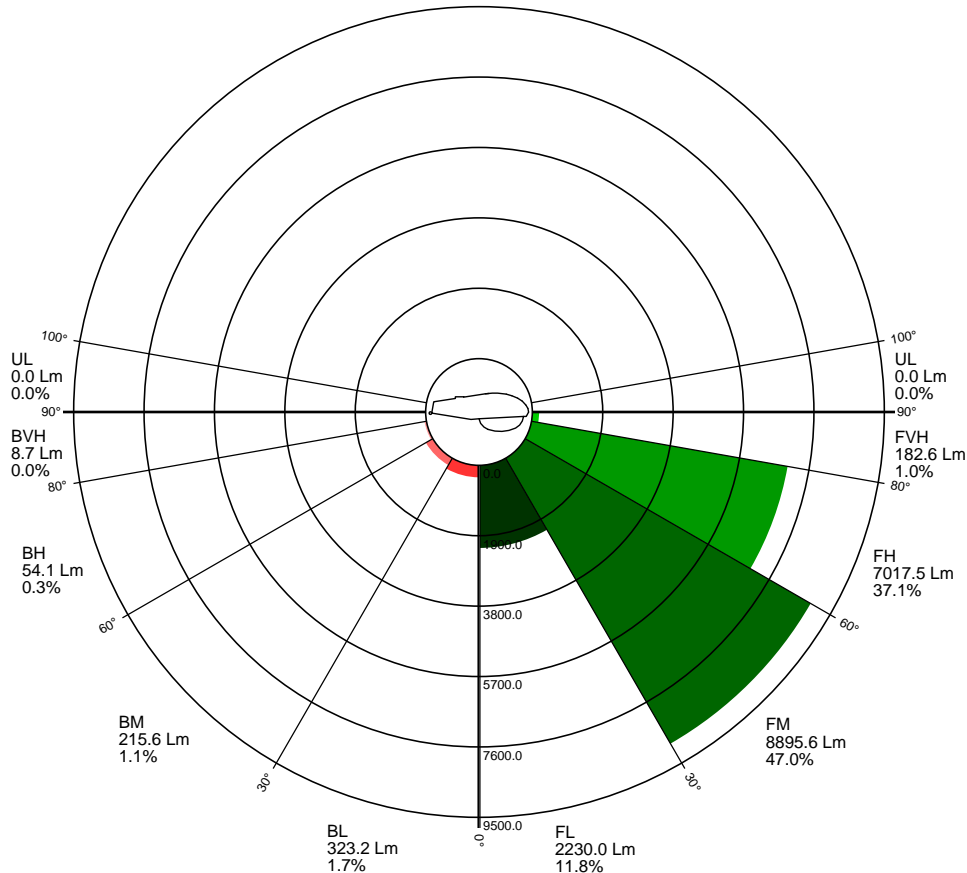
B U G

Forward		18326	96.8			
FL	(0° - 30°)	2230.0	11.8			
FM	(30° - 60°)	8895.6	47.0			
FH	(60° - 80°)	7017.5	37.1			G3
FVH	(80° - 90°)	182.6	1.0			G2
Backward		602	3.2			
BL	(0° - 30°)	323.2	1.7	B1		
BM	(30° - 60°)	215.6	1.1	B0		
BH	(60° - 80°)	54.1	0.3	B0		G0
BVH	(80° - 90°)	8.7	0.0			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		18927	100.0			

Zonal Lumen Summary

(Linear scale)

UH
0.0 Lm
0.0%

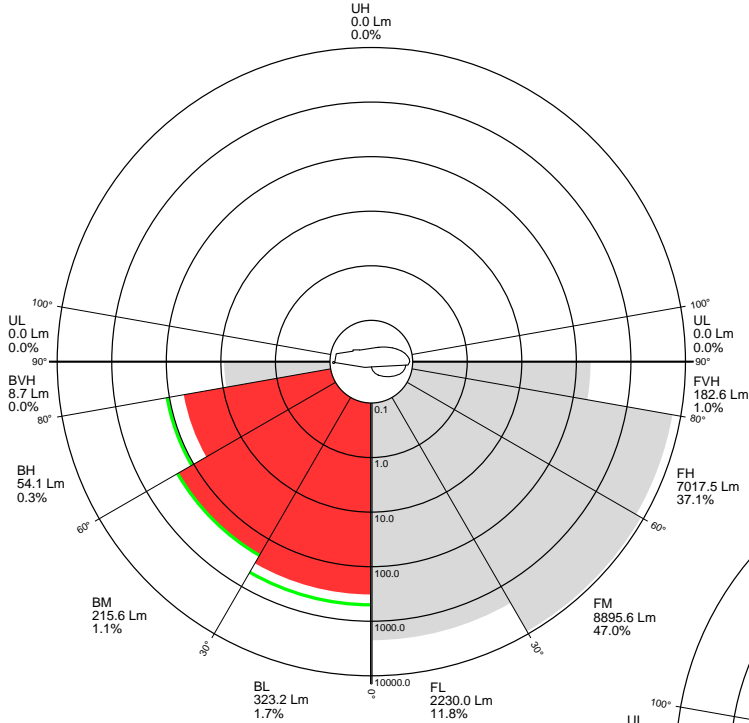


REPORT NUMBER: RAB04284
ISSUE DATE: 04/18/18
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 6 OF 9
DATE SAMPLE TESTED: 04/18/18

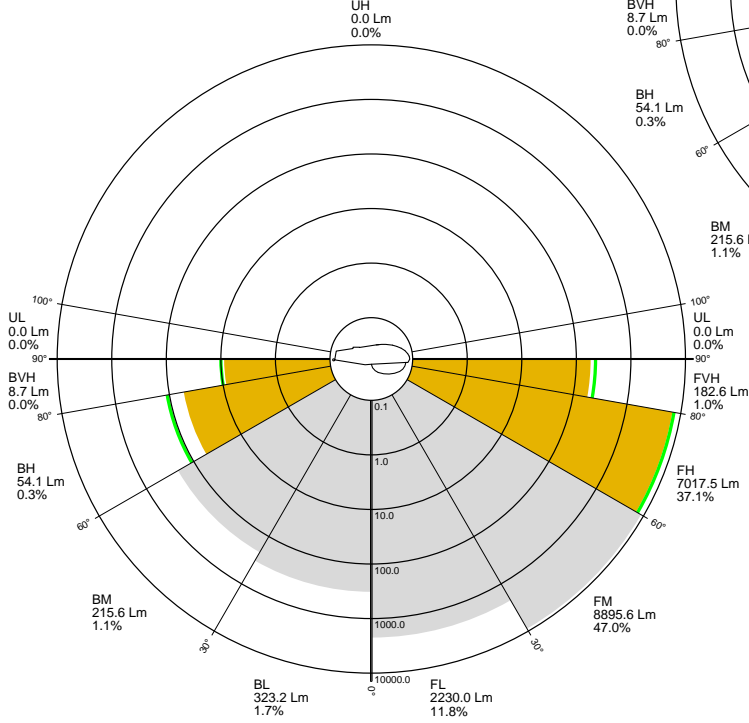
Backlight Rating Details

(Logarithmic scale)



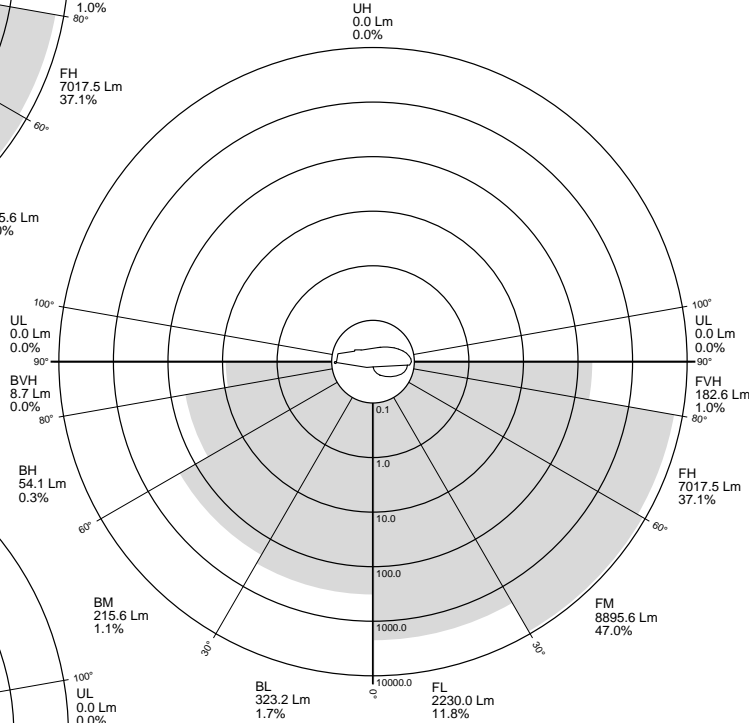
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB04284

PAGE: 7 OF 9

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DATE SAMPLE TESTED: 04/18/18

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	22.	29.	27.	30.	18.	22.	23.	23.	24.
	85.0	64.	66.	125.	255.	167.	128.	81.	94.	41. 26.
V	82.5	179.	209.	354.	703.	701.	753.	477.	324.	120. 51.
E	80.0	1783.	1909.	2133.	2812.	2246.	1956.	1616.	1154.	509. 194.
R	77.5	4670.	4675.	5146.	5458.	4793.	3793.	2775.	1711.	836. 350.
T	75.0	7566.	7548.	7984.	8493.	7826.	6328.	3901.	2393.	1158. 511.
I	72.5	11058.	10893.	11643.	12133.	10042.	7446.	4984.	3057.	1700. 805.
C	70.0	14991.	14666.	14199.	12801.	10720.	8035.	6034.	4320.	2586. 1194.
A	67.5	14131.	13646.	13500.	12462.	11327.	8788.	6714.	5289.	3430. 1732.
L	65.0	14026.	13400.	13661.	12624.	11598.	9161.	7321.	5690.	4075. 2095.
	62.5	14421.	13542.	13646.	12722.	11905.	9924.	7225.	5822.	4420. 2099.
A	60.0	14398.	13318.	13105.	12408.	11874.	10399.	7773.	5756.	4379. 1943.
N	57.5	13556.	12445.	12046.	11562.	10499.	10213.	8535.	5779.	4095. 1917.
G	55.0	12252.	11384.	11102.	10441.	10033.	10300.	8626.	5832.	3894. 1940.
L	52.5	11525.	10934.	10457.	10389.	10005.	9708.	7992.	5621.	3711. 1979.
E	50.0	12225.	11845.	11466.	10954.	9719.	9327.	7474.	5456.	3708. 2069.
	47.5	13293.	12794.	11701.	11043.	10144.	8674.	6933.	5272.	3712. 2059.
	45.0	12990.	12656.	11600.	11213.	9923.	7894.	6431.	5104.	3642. 2132.
	42.5	12920.	12669.	11945.	11012.	9033.	7483.	6221.	5003.	3594. 2262.
	40.0	12885.	12630.	11879.	10102.	8489.	7280.	6222.	4976.	3487. 2299.
	37.5	11947.	11662.	10827.	9290.	8116.	7094.	6129.	4969.	3562. 2352.
	35.0	11011.	10674.	9788.	8767.	7739.	6970.	6002.	4817.	3605. 2525.
	30.0	9590.	9421.	8554.	7942.	7160.	6411.	5624.	4681.	3586. 2727.
	25.0	8702.	8596.	7868.	7266.	6593.	5930.	5284.	4498.	3591. 2871.
	20.0	7739.	7668.	7275.	6678.	6145.	5576.	4924.	4178.	3512. 2843.
	15.0	6621.	6561.	6366.	5935.	5464.	4962.	4454.	3914.	3545. 2888.
	10.0	5335.	5310.	5166.	4896.	4591.	4264.	4015.	3729.	3371. 2875.
	5.0	4090.	4079.	4016.	3941.	3852.	3729.	3556.	3330.	3109. 2861.
	0.0	2821.	2821.	2821.	2821.	2821.	2821.	2821.	2821.	2821.

||
PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB04284

PAGE: 8 OF 9

ISSUE DATE: 04/18/18

DATE SAMPLE TESTED: 04/18/18

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	24.	24.	23.	22.	21.	19.	17.	15.	13.	13.	12.
	85.0	25.	25.	23.	22.	20.	19.	17.	14.	11.	10.	10.
	82.5	37.	29.	24.	22.	20.	18.	16.	13.	9.	8.	8.
	80.0	80.	33.	27.	22.	20.	18.	15.	12.	8.	7.	7.
	77.5	129.	54.	30.	23.	20.	17.	15.	11.	8.	6.	6.
	75.0	261.	72.	30.	25.	20.	17.	14.	11.	7.	5.	5.
	72.5	404.	118.	31.	26.	20.	17.	14.	11.	7.	5.	5.
	70.0<<	638.	228.	36.	27.	20.	17.	14.	11.	7.	5.	5.
	67.5	962.	285.	47.	27.	25.	17.	14.	11.	8.	5.	5.
	65.0	1158.	339.	62.	29.	24.	19.	14.	11.	8.	5.	6.
	62.5	1207.	392.	70.	29.	24.	20.	16.	11.	8.	6.	7.
	60.0	1209.	481.	67.	47.	24.	20.	20.	13.	8.	6.	7.
	57.5	1402.	558.	94.	56.	24.	20.	18.	20.	13.	10.	10.
	55.0	1496.	660.	129.	54.	27.	22.	19.	19.	20.	17.	18.
	52.5	1467.	746.	188.	52.	34.	25.	24.	18.	18.	18.	19.
	50.0	1426.	744.	242.	57.	41.	26.	27.	28.	21.	19.	19.
	47.5	1400.	762.	264.	73.	53.	29.	21.	25.	21.	20.	19.
	45.0	1442.	846.	338.	91.	62.	32.	28.	18.	18.	17.	18.
	42.5	1572.	958.	412.	97.	67.	47.	28.	20.	18.	17.	18.
	40.0	1659.	1046.	411.	130.	64.	61.	35.	27.	20.	19.	20.
	37.5	1698.	1153.	442.	202.	65.	61.	57.	40.	28.	23.	25.
35.0	1835.	1254.	496.	303.	70.	60.	79.	66.	46.	38.	42.	
30.0	2066.	1459.	703.	401.	170.	79.	72.	70.	73.	75.	86.	
25.0	2271.	1707.	1023.	570.	433.	190.	88.	70.	68.	71.	75.	
20.0	2336.	1853.	1277.	774.	549.	417.	305.	183.	128.	113.	117.	
15.0	2490.	2097.	1651.	1107.	781.	589.	517.	449.	419.	386.	397.	
10.0	2627.	2367.	1914.	1685.	1330.	1069.	942.	831.	788.	757.	780.	
5.0	2727.	2602.	2375.	2173.	2016.	1883.	1840.	1776.	1730.	1661.	1741.	
0.0	2821.	2821.	2821.	2821.	2821.	2821.	2821.	2821.	2821.	2821.	2821.	

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB04284

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PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 9 OF 9

DATE SAMPLE TESTED: 04/18/18

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	67
5- 10	198
10- 15	337
15- 20	487
20- 25	647
25- 30	817
30- 35	1001
35- 40	1228
40- 45	1457
45- 50	1644
50- 55	1767
55- 60	2013
60- 65	2204
65- 70	2181
70- 75	1793
75- 80	893
80- 85	177
85- 90	15
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	265
0- 20	1089
0- 30	2553
0- 40	4783
0- 50	7884
0- 60	11664
0- 70	16050
0- 80	18736
0- 90	18927
0-100	18927
0-110	18927
0-120	18927
0-130	18927
0-140	18927
0-150	18927
0-160	18927
0-170	18927
0-180	18927

REPORT NUMBER: RAB04285
DATE: 4/17/2018
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
CATALOG NUMBER: ALED4T150Y - RWLED4T150Y - RWLED4T150SFY - WPLED4T150Y (TYPE IV) (ALSO APPLIES TO RCL)

Page 1 of 4

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED METAL HOUSING, 6 CIRCUIT BOARDS EACH WITH 1 LED, MOLDED 2-PIECE 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 56-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 18-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 57-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 16-DEGREES FROM STRAIGHT AHEAD, 2 LEDs TILTED 57-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 22-DEGREES FROM STRAIGHT AHEAD.

DRIVER: RDD-160

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	3/08/19
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	02/22/19

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: RAB04285
 DATE: 4/17/2018
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: ALED4T150Y - RWLED4T150Y - RWLED4T150SFY - WPLED4T150Y (TYPE IV) (ALSO APPLIES TO RCL)

Page 2 of 4

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	18927 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4370
Chromaticity Ordinate y	0.4083
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2488
Chromaticity Ordinate v'	0.5230
Correlated Color Temp CCT (K)	3033
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	52653 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.31
Input Power (Watts)	156.7
Input Power Factor (%)	99.3
Input Current THD (%)	8.2
Input Voltage THD (%)	0.1
EFFICACY (Lumens/Watt)	
	120.8
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.581
Input Power (Watts)	153.6
Input Power Factor (%)	95.5
Input Current THD (%)	14.3
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	81
R3 Strong yellowish green	95
R4 Moderate yellowish green	68
R5 Light bluish green	67
R6 Light blue	77
R7 Light violet	75
R8 Light reddish purple	38
R9 Strong red	-46
R10 Strong yellow	60
R11 Strong green	64
R12 Strong blue	58
R13 Light yellowish pink (skin)	68
R14 Moderate olive green (leaf)	97

*NOTE:

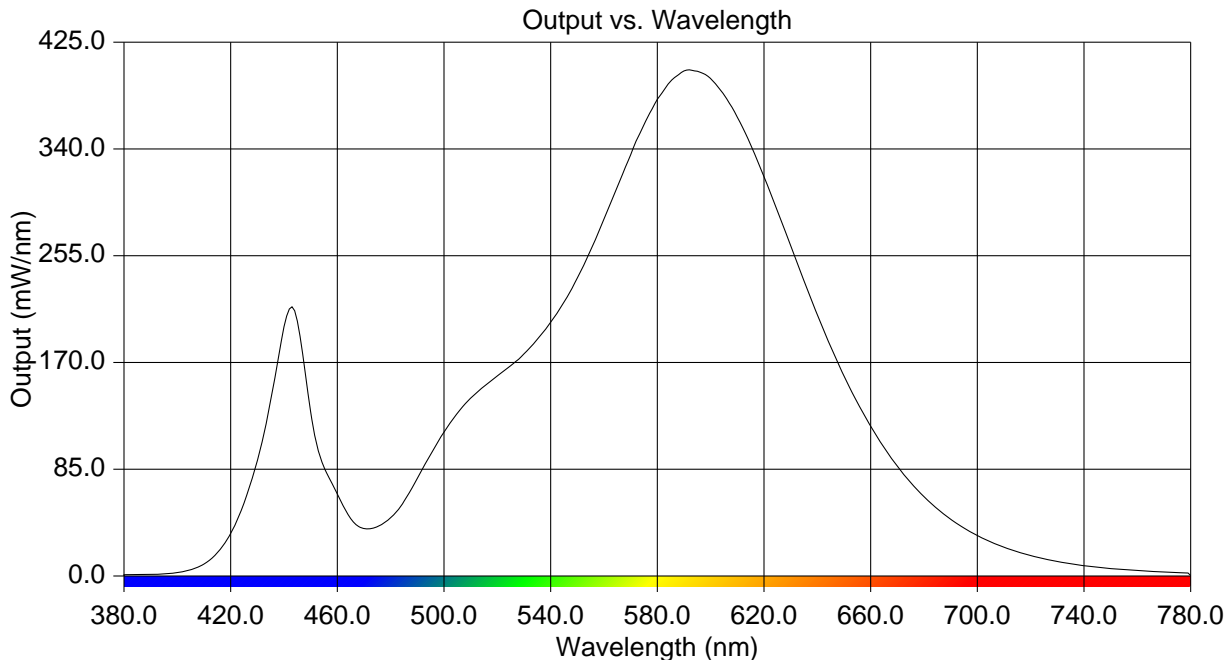
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB04285
 DATE: 4/17/2018
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: ALED4T150Y - RWLED4T150Y - RWLED4T150SFY - WPLED4T150Y (TYPE IV) (ALSO APPLIES TO RCL)

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.972	515	151.153	650	159.655
385	1.099	520	159.605	655	138.226
390	1.298	525	167.574	660	119.451
395	1.687	530	177.044	665	102.418
400	2.673	535	188.623	670	87.404
405	4.955	540	202.140	675	74.437
410	9.532	545	218.267	680	63.196
415	18.520	550	237.503	685	53.539
420	33.776	555	259.913	690	45.145
425	58.027	560	284.361	695	38.215
430	91.875	565	310.026	700	32.202
435	139.391	570	335.629	705	27.139
440	198.658	575	359.609	710	22.859
445	203.172	580	379.870	715	19.281
450	130.746	585	394.485	720	16.304
455	86.637	590	402.479	725	13.667
460	65.268	595	402.236	730	11.565
465	45.764	600	396.403	735	9.761
470	37.750	605	383.533	740	8.237
475	39.494	610	365.562	745	7.004
480	46.270	615	343.509	750	5.931
485	59.545	620	318.536	755	5.059
490	77.711	625	291.470	760	4.312
495	97.076	630	262.877	765	3.665
500	114.669	635	234.923	770	3.146
505	129.436	640	208.161	775	2.692
510	141.815	645	183.113	780	0.405



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CIE Chromaticity Diagram

