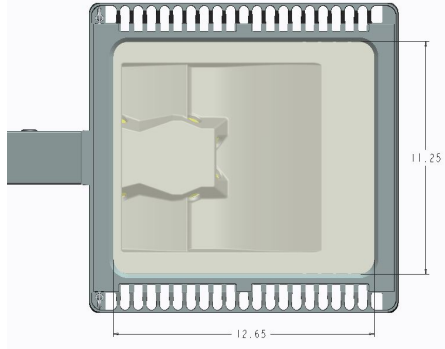


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 25 foot mounting height.



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PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

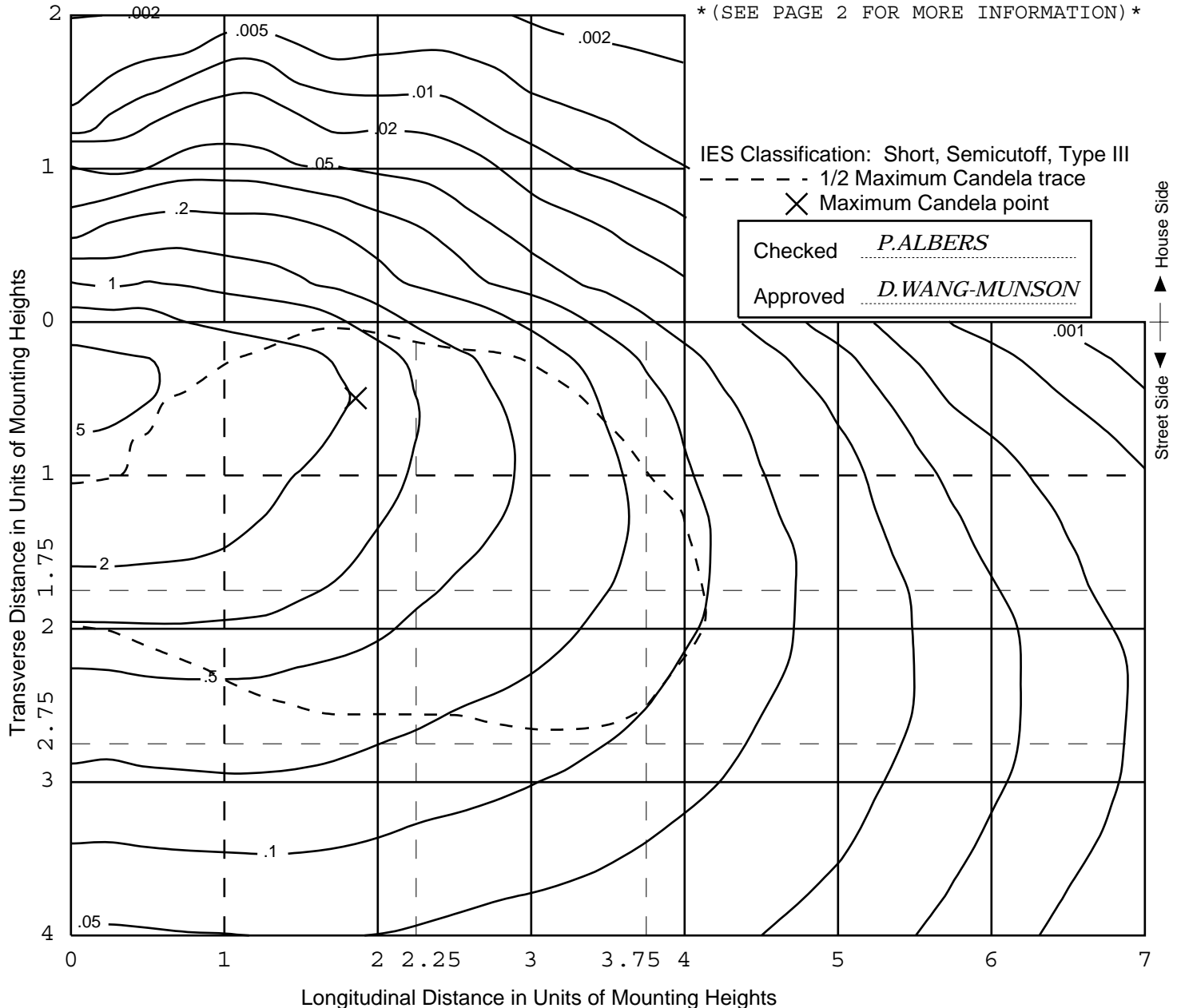
CATALOG NUMBER: ALED3T150N -

RWLED3T150N - RWLED3T150SFN -

WPLED3T150N (TYPE III) (ALSO APPLIES TO RCL)

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 WHITE PAINTED METAL LENS FRAME.

(SEE PAGE 2 FOR MORE INFORMATION)



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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 = 162.06 W AT 120.0 VAC.

LED DRIVER: RDD-160

TEST PROCEDURE: IESNA LM-79-08

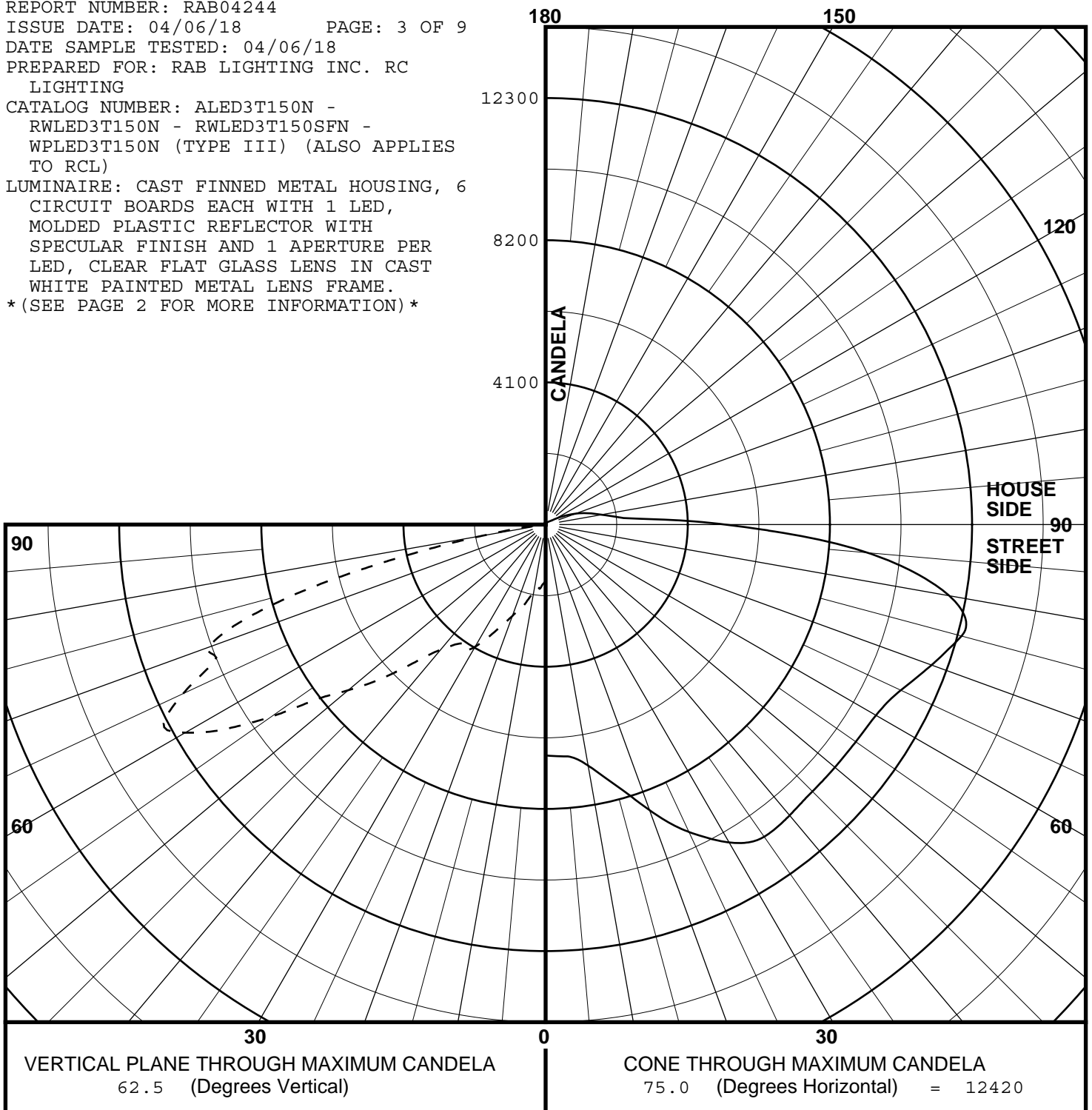
LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE

AMBIENT: 24.9

ACCREDITED LABORATORY CODE 201058-0

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

REPORT NUMBER: RAB04244
 ISSUE DATE: 04/06/18 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 04/06/18
 PREPARED FOR: RAB LIGHTING INC. RC
 LIGHTING
 CATALOG NUMBER: ALED3T150N -
 RWLED3T150N - RWLED3T150SFN -
 WPLED3T150N (TYPE III) (ALSO APPLIES
 TO RCL)
 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
 WHITE PAINTED METAL LENS FRAME.
 (SEE PAGE 2 FOR MORE INFORMATION)



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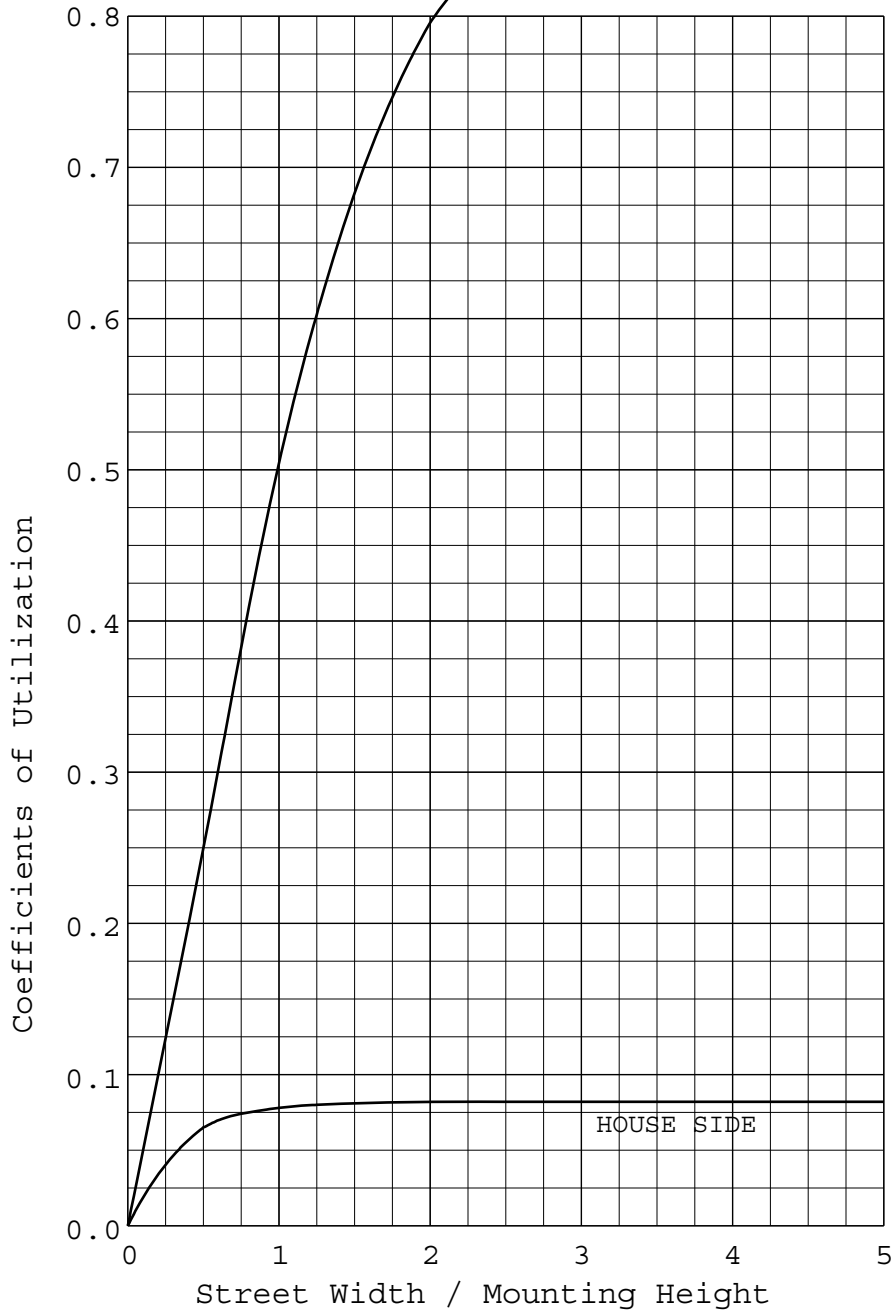
ISSUE DATE: 04/06/18

STREET SIDE

DATE SAMPLE TESTED: 04/06/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	17124.	91.7
DOWNWARD HOUSE SIDE	1541.	8.3
DOWNWARD TOTAL	18665.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	18665.	100.0
TOTAL INPUT WATTS = 162.1		
EFFICACY = 115.1 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.

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PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

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DATE SAMPLE TESTED: 04/06/18

BUG Rating:

Zonal Summary

Lumens

% of Fixture

B1 U0 G3

Zone Ratings

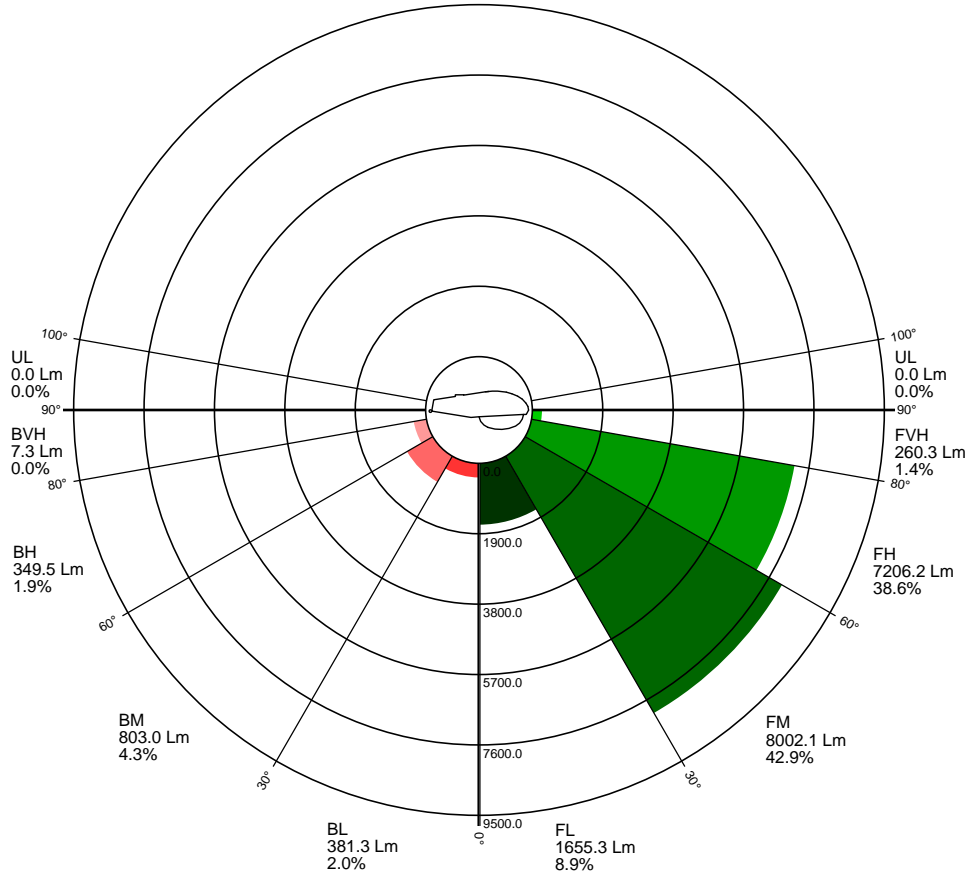
B U G

Forward		17124	91.7			
FL	(0° - 30°)	1655.3	8.9			
FM	(30° - 60°)	8002.1	42.9			
FH	(60° - 80°)	7206.2	38.6			G3
FVH	(80° - 90°)	260.3	1.4			G3
Backward		1541	8.3			
BL	(0° - 30°)	381.3	2.0	B1		
BM	(30° - 60°)	803.0	4.3	B1		
BH	(60° - 80°)	349.5	1.9	B1		G1
BVH	(80° - 90°)	7.3	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		18665	100.0			

Zonal Lumen Summary

(Linear scale)

UH
0.0 Lm
0.0%



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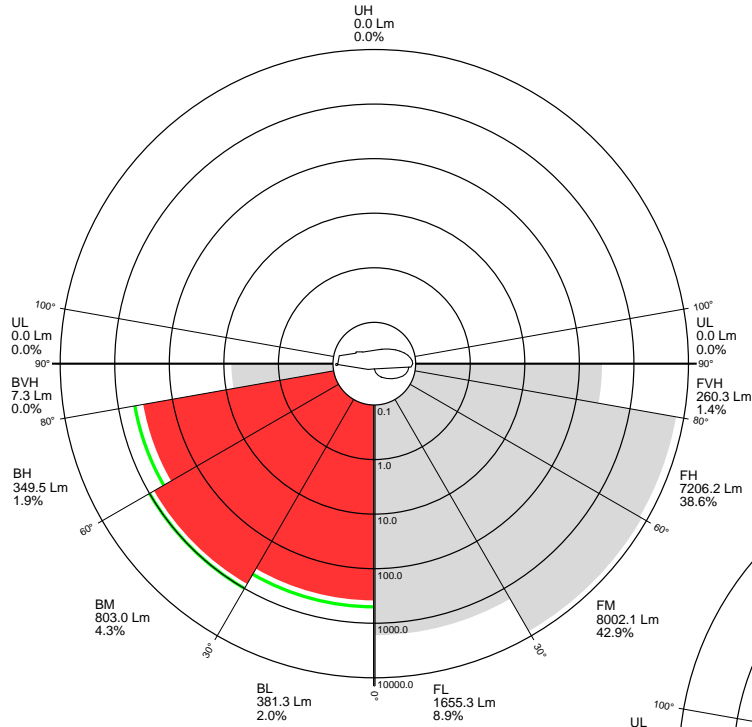
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

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DATE SAMPLE TESTED: 04/06/18

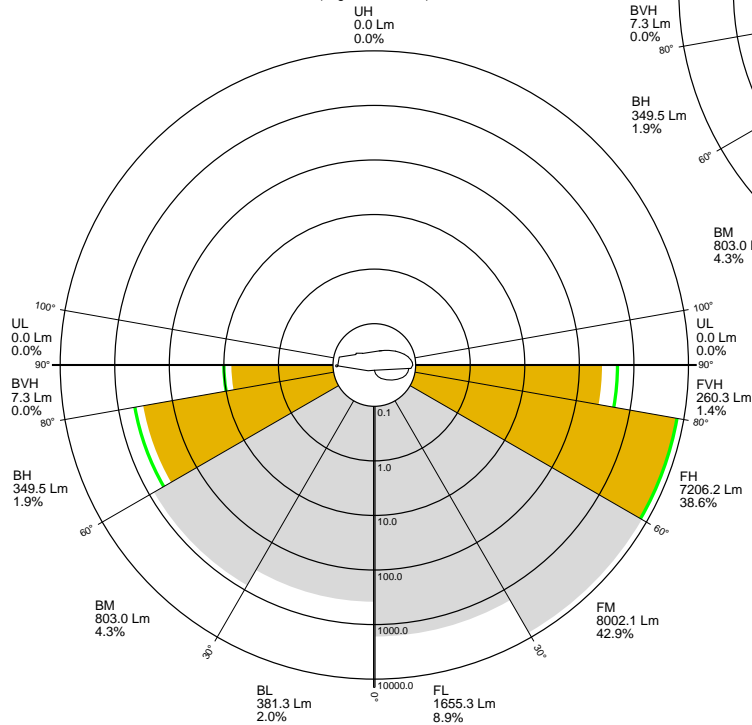
Backlight Rating Details

(Logarithmic scale)



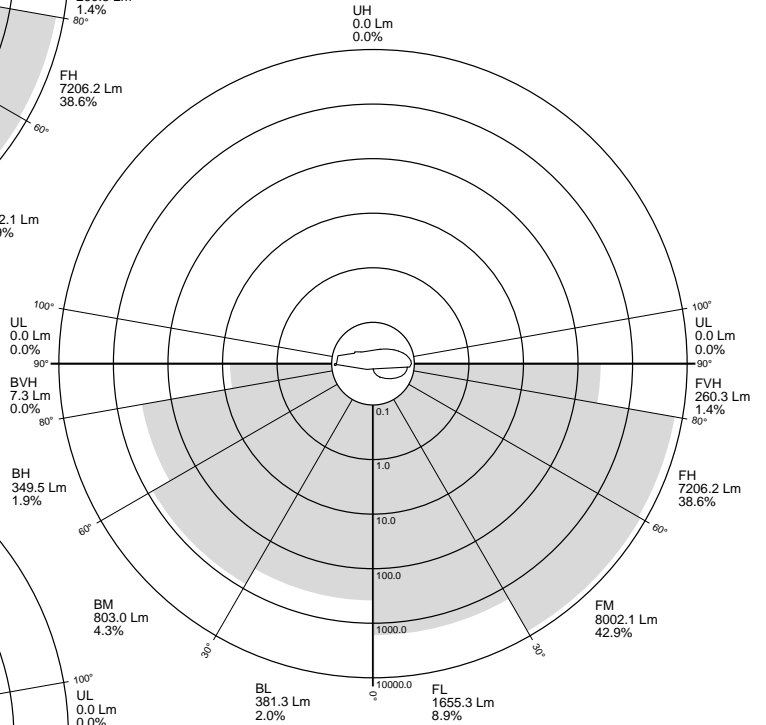
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



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DATE SAMPLE TESTED: 04/06/18

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.	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	9.	9.	14.	13.	28.	35.	26.	22.	18.	16.
	85.0	53.	51.	127.	153.	247.	204.	221.	304.	157.	39.
V	82.5	181.	220.	478.	582.	907.	1126.	1194.	1263.	694.	166.
E	80.0	464.	566.	978.	1455.	2089.	3153.	3718.	3426.	1865.	603.
R	77.5	1327.	1396.	1941.	2819.	3507.	4944.	6175.	6455.	4123.	1957.
T	75.0	2347.	2365.	2947.	3897.	4749.	6016.	8018.	9114.	6950.	3877.
I	72.5	3058.	3053.	3750.	4895.	6063.	7167.	9207.	10752.	9114.	5856.
C	70.0	3695.	3578.	4457.	5784.	7429.	9957.	10217.	11013.	10344.	6858.
A	67.5	4213.	4212.	5207.	6904.	9515.	11274.	11173.	10867.	10341.	7078.
L	65.0	5073.	5160.	6554.	8144.	10771.	11155.	11549.	11576.	11541.	8078.
	62.5<<	6657.	6710.	7773.	9782.	10991.	10883.	10921.	11303.	12420.	9337.
A	60.0	8353.	8419.	9223.	10073.	10743.	10620.	10181.	11320.	12001.	8756.
N	57.5	8561.	8600.	8826.	9146.	9712.	9551.	9466.	11480.	10990.	7965.
G	55.0	7786.	7852.	8181.	8558.	8420.	8777.	9187.	10531.	9657.	6846.
L	52.5	7218.	7270.	7518.	7489.	7409.	8280.	9269.	9820.	8242.	5764.
E	50.0	6763.	6816.	6839.	6652.	6976.	8101.	8552.	8980.	7436.	5047.
	47.5	6359.	6347.	6298.	6271.	6774.	7665.	7607.	7656.	6702.	4493.
	45.0	6005.	6024.	6020.	6278.	6496.	7040.	7124.	6865.	5917.	3890.
	42.5	5988.	6016.	6038.	6453.	6271.	6715.	6682.	6192.	5196.	3515.
	40.0	5771.	5814.	5952.	6714.	5948.	6489.	6195.	5726.	4713.	3201.
	37.5	5769.	5797.	5981.	6286.	6126.	6297.	5821.	5531.	4383.	3002.
	35.0	6032.	6020.	5861.	6101.	6027.	5806.	5655.	5419.	4186.	2919.
	30.0	6068.	6072.	5653.	5550.	5345.	5135.	5138.	4959.	4073.	2744.
	25.0	5725.	5711.	5142.	4889.	4822.	4809.	4662.	4143.	3366.	2420.
	20.0	5257.	5292.	4994.	4606.	4498.	4374.	3970.	3506.	2803.	2108.
	15.0	4673.	4719.	4629.	4265.	3884.	3571.	3322.	2935.	2398.	1939.
	10.0	3774.	3847.	3805.	3619.	3317.	2917.	2563.	2263.	1951.	1712.
	5.0	2610.	2677.	2593.	2522.	2394.	2313.	2147.	2009.	1852.	1727.
	0.0	1630.	1630.	1630.	1630.	1630.	1630.	1630.	1630.	1630.	1630.

||
PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB04244

PAGE: 8 OF 9

ISSUE DATE: 04/06/18

DATE SAMPLE TESTED: 04/06/18

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 A N G L E	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	15.	14.	15.	14.	14.	12.	10.	7.	7.	7.	7.
	85.0	20.	17.	16.	14.	12.	11.	9.	7.	6.	7.	7.
	82.5	49.	31.	20.	16.	12.	10.	9.	7.	6.	6.	7.
	80.0	246.	130.	72.	39.	14.	10.	8.	6.	6.	6.	7.
	77.5	917.	517.	147.	90.	15.	9.	8.	6.	6.	7.	7.
	75.0	2011.	813.	267.	108.	32.	11.	8.	7.	9.	10.	10.
	72.5	3091.	1185.	371.	161.	100.	25.	9.	7.	10.	11.	11.
	70.0	3838.	1574.	723.	283.	116.	36.	13.	7.	10.	10.	10.
	67.5	3964.	1744.	1036.	402.	125.	53.	32.	10.	12.	13.	12.
	65.0	4337.	1832.	1108.	472.	151.	83.	67.	20.	13.	14.	14.
	62.5<<	5187.	2221.	1267.	594.	202.	150.	104.	33.	18.	14.	13.
	60.0	5526.	2378.	1507.	660.	254.	208.	111.	46.	25.	18.	16.
	57.5	5353.	2490.	1537.	835.	306.	224.	121.	57.	28.	17.	16.
	55.0	4653.	2411.	1489.	932.	347.	237.	136.	68.	32.	15.	14.
	52.5	4038.	2474.	1411.	889.	410.	259.	149.	80.	40.	16.	13.
	50.0	3627.	2606.	1342.	862.	475.	297.	163.	85.	49.	33.	22.
	47.5	3244.	2474.	1340.	908.	563.	324.	181.	97.	57.	78.	68.
	45.0	2904.	2321.	1375.	908.	600.	347.	222.	111.	81.	72.	93.
	42.5	2670.	2152.	1390.	883.	659.	386.	241.	138.	91.	60.	52.
	40.0	2508.	2052.	1377.	869.	708.	430.	260.	180.	126.	83.	68.
	37.5	2436.	2042.	1410.	864.	730.	461.	286.	171.	148.	120.	123.
	35.0	2454.	2101.	1483.	886.	722.	472.	337.	207.	151.	124.	114.
30.0	2323.	2035.	1538.	1000.	714.	602.	395.	274.	212.	170.	143.	
25.0	2111.	1867.	1519.	1174.	750.	545.	417.	306.	235.	226.	225.	
20.0	1878.	1695.	1378.	1202.	903.	623.	461.	362.	300.	292.	284.	
15.0	1769.	1677.	1423.	1255.	1073.	878.	728.	656.	624.	642.	654.	
10.0	1605.	1530.	1397.	1263.	1189.	1140.	1072.	1031.	945.	897.	893.	
5.0	1673.	1623.	1527.	1445.	1368.	1310.	1242.	1196.	1146.	1136.	1121.	
0.0	1630.	1630.	1630.	1630.	1630.	1630.	1630.	1630.	1630.	1630.	1630.	

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB04244

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PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

PAGE: 9 OF 9

DATE SAMPLE TESTED: 04/06/18

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	41
5- 10	137
10- 15	255
15- 20	384
20- 25	527
25- 30	693
30- 35	872
35- 40	1030
40- 45	1218
45- 50	1485
50- 55	1863
55- 60	2336
60- 65	2520
65- 70	2248
70- 75	1779
75- 80	1008
80- 85	251
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	177
0- 20	817
0- 30	2037
0- 40	3939
0- 50	6643
0- 60	10842
0- 70	15610
0- 80	18397
0- 90	18665
0-100	18665
0-110	18665
0-120	18665
0-130	18665
0-140	18665
0-150	18665
0-160	18665
0-170	18665
0-180	18665

REPORT NUMBER: RAB04245
DATE: 4/9/2018
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
CATALOG NUMBER: ALED3T150N - RWLED3T150N - RWLED3T150SFN - WPLED3T150N (TYPE III)
(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 PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST WHITE 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-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: RAB04245
 DATE: 4/9/2018
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: ALED3T150N - RWLED3T150N - RWLED3T150SFN - WPLED3T150N (TYPE III)
 (ALSO APPLIES TO RCL)

Page 2 of 4

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	18665 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3863
Chromaticity Ordinate y	0.3861
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2253
Chromaticity Ordinate v'	0.5065
Correlated Color Temp CCT (K)	3913
ANSI C78.377-2008 Duv	0.003
Total Radiant Flux (milliWatts)	53424 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.36
Input Power (Watts)	162.1
Input Power Factor (%)	99.4
Input Current THD (%)	7.8
Input Voltage THD (%)	0.1
EFFICACY (Lumens/Watt)	
	115.1
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.601
Input Power (Watts)	158.7
Input Power Factor (%)	95.3
Input Current THD (%)	14.4
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	74
R1 Light greyish red	69
R2 Dark greyish yellow	80
R3 Strong yellowish green	92
R4 Moderate yellowish green	74
R5 Light bluish green	71
R6 Light blue	75
R7 Light violet	80
R8 Light reddish purple	49
R9 Strong red	-37
R10 Strong yellow	57
R11 Strong green	72
R12 Strong blue	59
R13 Light yellowish pink (skin)	71
R14 Moderate olive green (leaf)	95

*NOTE:

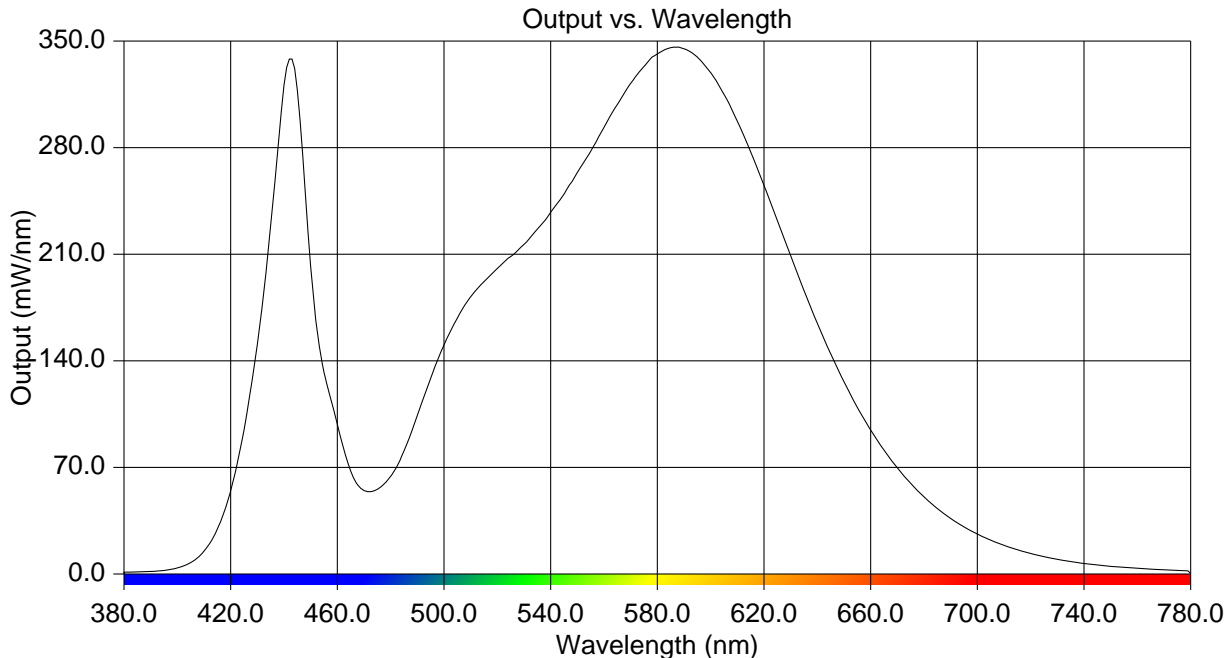
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB04245
 DATE: 4/9/2018
 PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
 CATALOG NUMBER: ALED3T150N - RWLED3T150N - RWLED3T150SFN - WPLED3T150N (TYPE III)
 (ALSO APPLIES TO RCL)

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	1.136	515	192.025	650	126.091
385	1.347	520	200.470	655	109.315
390	1.658	525	208.265	660	94.410
395	2.387	530	216.291	665	81.276
400	3.955	535	226.356	670	69.539
405	7.507	540	237.491	675	59.454
410	15.019	545	249.337	680	50.577
415	29.278	550	263.488	685	42.905
420	54.837	555	277.586	690	36.468
425	94.321	560	293.274	695	30.908
430	151.478	565	308.092	700	26.196
435	227.876	570	321.975	705	22.165
440	320.787	575	333.096	710	18.813
445	317.539	580	341.075	715	15.879
450	201.760	585	345.369	720	13.427
455	132.356	590	344.684	725	11.398
460	98.294	595	339.317	730	9.641
465	67.620	600	328.964	735	8.157
470	54.672	605	314.407	740	6.945
475	55.691	610	297.092	745	5.909
480	64.004	615	276.845	750	5.043
485	80.818	620	255.286	755	4.312
490	104.129	625	232.302	760	3.680
495	128.584	630	208.737	765	3.165
500	150.335	635	185.874	770	2.710
505	167.901	640	164.591	775	2.331
510	182.054	645	144.598	780	0.348



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CIE Chromaticity Diagram

