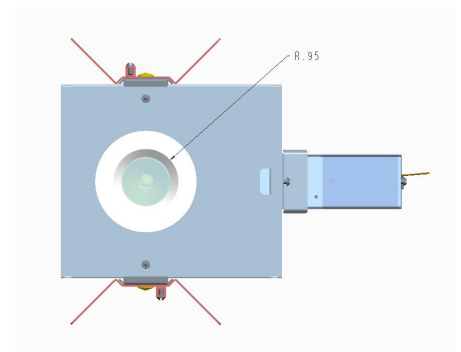


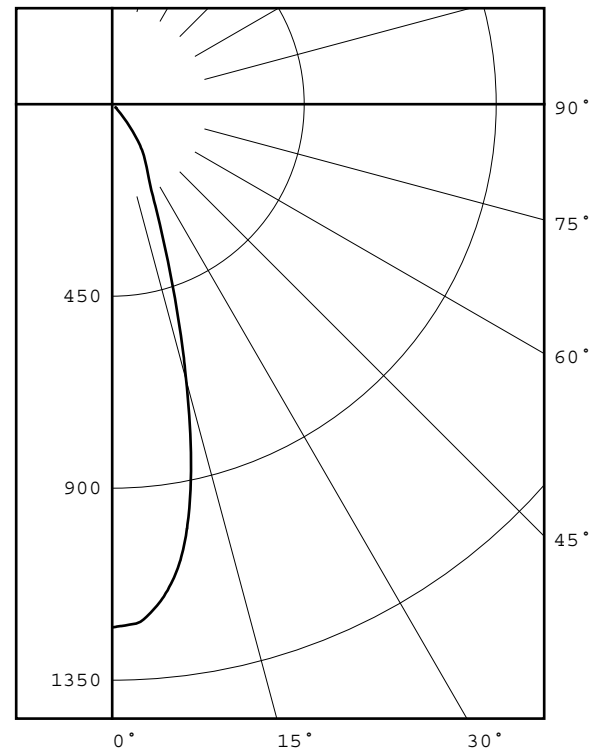
REPORT NUMBER: RAB01213
 ISSUE DATE: 10/01/15
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: RDLED2R8-30YYHC-TW (2" Round recessed downlight - medium beam - >90 High CRI)
 LUMINAIRE: FABRICATED METAL UPPER HOUSING AND BALLAST HOUSING, CAST WHITE PAINTED FINNED METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH ONE LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, HOLOGRAPHIC FLAT PLASTIC LENS, CAST WHITE PAINTED METAL LOWER HOUSING.
 LAMP: ONE WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), VERTICAL BASE-UP POSITION.
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
 TOTAL INPUT WATTS: 8.252 W AT 120.0 VOLTS
 TEST PROCEDURE: IESNA LM-79-08
 TEST DISTANCE: 28.25 FEET
 PREPARED FOR: RAB LIGHTING INC.
 LED DRIVER: RD-008-E1-A0200
 ACCREDITED LABORATORY CODE 201085-0



DEG	CANDELA	LUMENS
0	1226	
5	1182	107
15	671	183
25	213	105
35	105	63
45	16	15
55	6	5
65	3	3
75	1	2
85	0	0
90	0	

ZONAL LUMEN ZONE	SUMMARY LUMENS	%FIXT
0- 30	395	81.6
0- 40	459	94.7
0- 60	479	99.0
0- 90	484	100.0
90-180	0	0.0
0-180	484	100.0

TOTAL INPUT WATTS = 8.3
 EFFICACY = 58.3 Lm/W
 CIE TYPE - DIRECT
 LUMINAIRE SPACING CRITERION = 0.5



Checked	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u>

REPORT NUMBER: RAB01213
ISSUE DATE: 10/01/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 2 OF 7
DATE SAMPLE TESTED: 10/01/15

BEAM ANGLE (50%) : 31.7 DEGREES
FIELD ANGLE (10%): 66.9 DEGREES

REPORT NUMBER: RAB01213
ISSUE DATE: 10/01/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 3 OF 7
DATE SAMPLE TESTED: 10/01/15

CANDELA DISTRIBUTION

	0.0
0.0	1226
2.5	1219
5.0	1182
7.5	1117
10.0	1010
12.5	854
15.0	671
17.5	503
20.0	370
22.5	273
25.0	213
27.5	179
30.0	156
32.5	133
35.0	105
37.5	74
40.0	46
42.5	26
45.0	16
47.5	11
50.0	9
52.5	7
55.0	6
57.5	5
60.0	4
62.5	4
65.0	3
67.5	3
70.0	3
72.5	2
75.0	1
77.5	1
80.0	1
82.5	0
85.0	0
87.5	0
90.0	0

REPORT NUMBER: RAB01213
ISSUE DATE: 10/01/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 7
DATE SAMPLE TESTED: 10/01/15

ZONAL LUMEN SUMMARY

0- 5	29.
5- 10	79.
10- 15	100.
15- 20	83.
20- 25	59.
25- 30	46.
30- 35	39.
35- 40	25.
40- 45	10.
45- 50	5.
50- 55	3.
55- 60	2.
60- 65	2.
65- 70	2.
70- 75	1.
75- 80	1.
80- 85	0.
85- 90	0.

REPORT NUMBER: RAB01213
ISSUE DATE: 10/01/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 5 OF 7
DATE SAMPLE TESTED: 10/01/15

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	29
5- 10	79
10- 15	100
15- 20	83
20- 25	59
25- 30	46
30- 35	39
35- 40	25
40- 45	10
45- 50	5
50- 55	3
55- 60	2
60- 65	2
65- 70	2
70- 75	1
75- 80	1
80- 85	0
85- 90	0

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	107
0- 20	291
0- 30	395
0- 40	459
0- 50	474
0- 60	479
0- 70	483
0- 80	484
0- 90	484

REPORT NUMBER: RAB01213
ISSUE DATE: 10/01/15

PAGE: 6 OF 7
DATE SAMPLE TESTED: 10/01/15

PREPARED FOR: RAB LIGHTING INC.

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	114	112	109	107	112	110	108	106	105	104	102	102	101	99	98	97	97	95
2	109	105	101	98	107	103	100	97	100	97	95	97	95	93	95	93	91	90
3	105	99	95	91	103	98	94	91	95	92	89	93	90	88	91	88	86	85
4	100	94	89	85	99	93	88	85	91	87	84	89	86	83	87	84	82	81
5	96	89	84	80	95	88	84	80	87	83	79	85	81	79	84	80	78	77
6	93	85	80	76	91	84	79	76	83	79	75	81	78	75	80	77	74	73
7	89	81	76	72	88	80	76	72	79	75	72	78	74	71	77	74	71	70
8	86	78	73	69	85	77	72	69	76	72	69	75	71	68	74	71	68	67
9	83	74	69	66	82	74	69	66	73	69	66	72	68	65	71	68	65	64
10	80	71	67	63	79	71	66	63	70	66	63	70	66	63	69	65	63	62

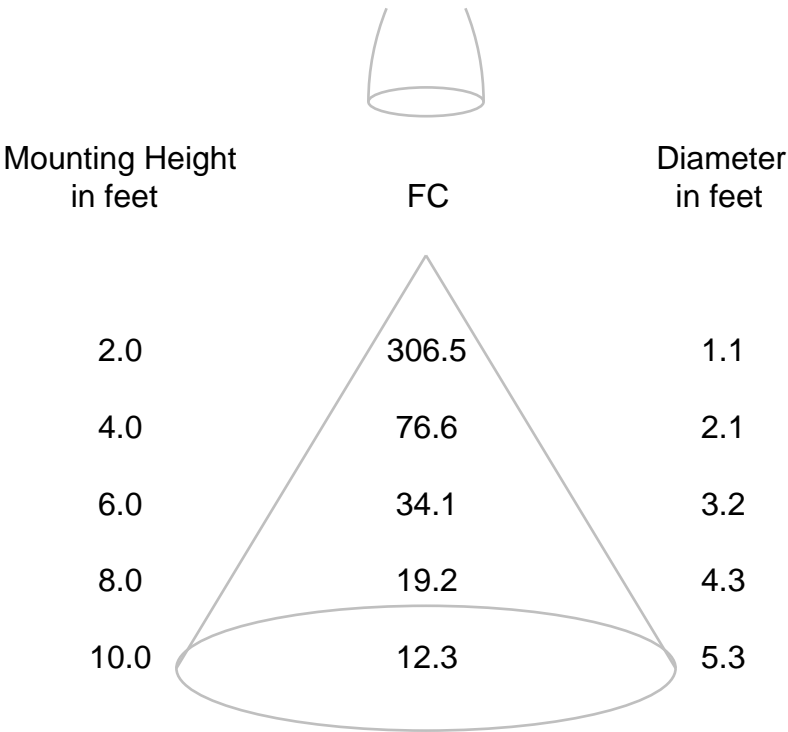
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

REPORT NUMBER: RAB01213
ISSUE DATE: 10/01/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 7
DATE SAMPLE TESTED: 10/01/15

CONE OF LIGHT DIAGRAM

(diameter shown is where fc value is half the fc at nadir)



REPORT NUMBER: RAB01212
DATE: 10/1/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2R8-30YYHC-TW (2" Round recessed downlight - medium beam - >90 High CRI)

ADDRESS: 170 LUDLOW AVE, NORTHVALE NJ 07647

LUMINAIRE: FABRICATED METAL UPPER HOUSING AND BALLAST HOUSING, CAST WHITE PAINTED FINNED METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH ONE LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, HOLOGRAPHIC FLAT PLASTIC LENS, CAST WHITE PAINTED METAL LOWER HOUSING.

LAMP: ONE WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), VERTICAL BASE-UP POSITION.

DRIVER: RD-008-E1-A0200

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120.0 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	8/21/16
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	8/21/16

OBJECT OF TEST: Measure the 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. Report Off-State Power.

PROCEDURE: The test sample was provided by the customer and had an unknown number of burn hours. The test sample was mounted inside the integrating sphere 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 120.0 VAC input in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. 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: RAB01212
 DATE: 10/1/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: RDLED2R8-30YYHC-TW (2" Round recessed downlight - medium beam - >90 High CRI)

Page 2 of 4

RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4625
Chromaticity Ordinate y	0.4151
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2622
Chromaticity Ordinate v'	0.5295
Correlated Color Temp CCT (K)	2697
Color Rendering Index (CRIa)	91
Color Rendering Index 1 (Light greyish red)	92
Color Rendering Index 2 (Dark greyish yellow)	97
Color Rendering Index 3 (Strong yellowish green)	98
Color Rendering Index 4 (Moderate yellowish green)	89
Color Rendering Index 5 (Light bluish green)	91
Color Rendering Index 6 (Light blue)	98
Color Rendering Index 7 (Light violet)	89
Color Rendering Index 8 (Light reddish purple)	78
Color Rendering Index 9 (Strong red)	54
Color Rendering Index 10 (Strong yellow)	92
Color Rendering Index 11 (Strong green)	89
Color Rendering Index 12 (Strong blue)	82
Color Rendering Index 13 (Light yellowish pink (skin))	93
Color Rendering Index 14 (Moderate olive green (leaf))	100
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	1696 *
ELECTRICAL FOR SPECTRORADIOMETRIC TEST	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.071
Input Power (Watts)	8.25
Input Power Factor (%)	96.8
Input Current THD (%)	22.7
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

*NOTE:

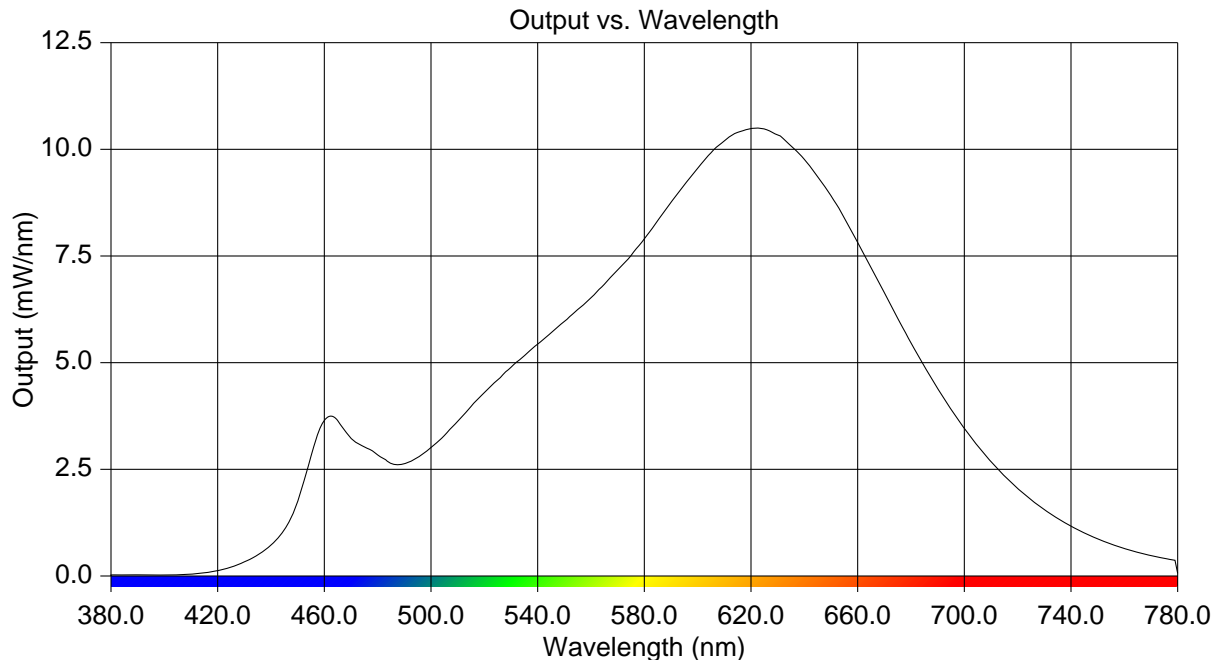
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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: RAB01212
 DATE: 10/1/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: RDLED2R8-30YYHC-TW (2" Round recessed downlight - medium beam - >90 High CRI)

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.025	515	3.972	650	8.905
385	0.025	520	4.297	655	8.384
390	0.023	525	4.593	660	7.825
395	0.023	530	4.892	665	7.229
400	0.024	535	5.160	670	6.642
405	0.030	540	5.435	675	6.041
410	0.044	545	5.697	680	5.460
415	0.074	550	5.966	685	4.906
420	0.125	555	6.245	690	4.396
425	0.206	560	6.516	695	3.912
430	0.332	565	6.836	700	3.455
435	0.496	570	7.169	705	3.053
440	0.724	575	7.510	710	2.683
445	1.081	580	7.902	715	2.350
450	1.752	585	8.329	720	2.052
455	2.808	590	8.755	725	1.788
460	3.649	595	9.171	730	1.553
465	3.643	600	9.563	735	1.345
470	3.226	605	9.918	740	1.164
475	3.027	610	10.198	745	1.007
480	2.838	615	10.398	750	0.873
485	2.640	620	10.492	755	0.752
490	2.635	625	10.479	760	0.649
495	2.781	630	10.338	765	0.559
500	3.010	635	10.079	770	0.481
505	3.291	640	9.765	775	0.416
510	3.620	645	9.352	780	0.062



REPORT NUMBER: RAB01212
DATE: 10/1/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2R8-30YYHC-TW (2" Round recessed downlight - medium beam - >90 High CRI)

Page 4 of 4

CIE Chromaticity Diagram

