

REPORT NUMBER: RAB01761

ISSUE DATE: 03/11/16

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: RDLED2S8-30N-TW (2" Square recessed downlight - medium beam)

PAGE: 1 OF 8

DATE SAMPLE TESTED: 03/11/16

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.

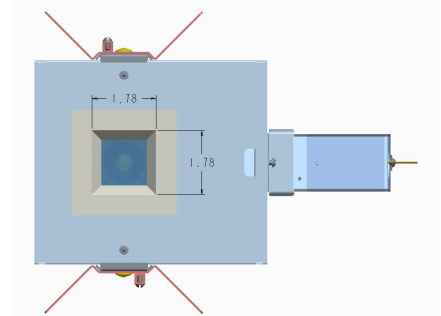
\*(SEE PAGE 2 FOR MORE INFORMATION)\*

### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0	2018	2018	2018	2018	2018
5	1930	1935	1928	1933	1921
15	966	937	901	942	958
25	364	378	343	379	374
35	107	150	205	154	111
45	17	23	47	23	17
55	8	9	12	9	8
65	4	4	4	4	4
75	2	2	1	2	2
85	0	0	0	0	0
90	0	0	0	0	0

### FLUX

172
262
172
97
25
9
4
2
0



### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	606	81.6
0- 40	702	94.7
0- 60	736	99.2
0- 90	742	100.0
90-180	0	0.0
0-180	742	100.0

TOTAL INPUT WATTS = 8.3

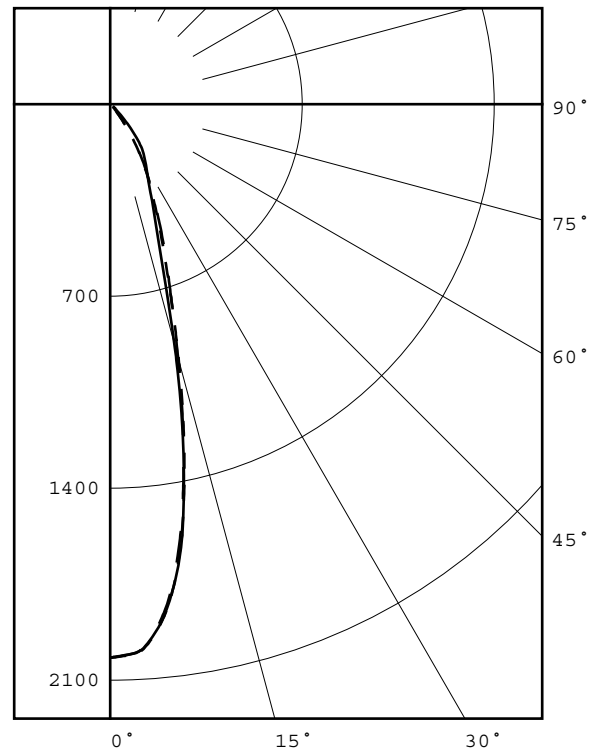
EFFICACY = 89.4 lm/W

CIE TYPE - DIRECT

PLANE	: 0-DEG	90-DEG
SPACING CRITERIA	: 0.5	0.5
PLANE	: 0-DEG	90-DEG
LUMINOUS LENGTH	: 1.780	1.780

### LUMINANCE DATA IN CANDELA/SQ METER

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	11757.	32505.	11757.
55	6821.	10231.	6821.
65	4629.	4629.	4629.
75	3779.	1889.	3779.
85	0.	0.	0.



#### LEGEND:

0-deg:	---
45-deg:	---
90-deg:	---

Checked

X.CAO

Approved

D.WANG-MUNSON

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ADDITIONAL INFORMATION

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: 8.2644 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

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.

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PLANE : 0-DEG 90-DEG  
BEAM ANGLE (50%) : 29.2 X 29.1 DEGREES  
FIELD ANGLE (10%): 62.0 X 62.4 DEGREES

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### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	2018	2018	2018	2018	2018
2.5	2008	2008	2005	2005	2004
5.0	1930	1935	1928	1933	1921
7.5	1773	1783	1774	1778	1756
10.0	1530	1545	1535	1539	1513
12.5	1242	1241	1219	1241	1228
15.0	966	937	901	942	958
17.5	739	696	656	704	738
20.0	572	542	501	546	590
22.5	456	450	412	450	470
25.0	364	378	343	379	374
27.5	292	320	296	322	299
30.0	227	266	263	270	233
32.5	165	208	235	213	169
35.0	107	150	205	154	111
37.5	62	98	167	101	64
40.0	35	58	121	59	36
42.5	23	35	78	35	23
45.0	17	23	47	23	17
47.5	13	17	30	17	13
50.0	11	13	21	13	11
52.5	9	11	16	11	9
55.0	8	9	12	9	8
57.5	7	7	9	7	7
60.0	5	6	7	6	6
62.5	5	5	6	5	5
65.0	4	4	4	4	4
67.5	3	3	3	3	4
70.0	3	3	3	3	3
72.5	2	2	2	2	2
75.0	2	2	1	2	2
77.5	2	1	1	1	2
80.0	1	1	1	1	1
82.5	0	0	0	0	0
85.0	0	0	0	0	0
87.5	0	0	0	0	0
90.0	0	0	0	0	0

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ZONAL LUMEN SUMMARY

0- 5	47.
5- 10	124.
10- 15	145.
15- 20	117.
20- 25	94.
25- 30	78.
30- 35	60.
35- 40	36.
40- 45	17.
45- 50	8.
50- 55	5.
55- 60	4.
60- 65	3.
65- 70	2.
70- 75	1.
75- 80	1.
80- 85	0.
85- 90	0.

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### 5-DEGREE ZONAL LUMEN SUMMARY

0- 5	47
5- 10	124
10- 15	145
15- 20	117
20- 25	94
25- 30	78
30- 35	60
35- 40	36
40- 45	17
45- 50	8
50- 55	5
55- 60	4
60- 65	3
65- 70	2
70- 75	1
75- 80	1
80- 85	0
85- 90	0
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	172
0- 20	434
0- 30	606
0- 40	702
0- 50	727
0- 60	736
0- 70	740
0- 80	742
0- 90	742
0-100	742
0-110	742
0-120	742
0-130	742
0-140	742
0-150	742
0-160	742
0-170	742
0-180	742

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## 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	106	104	103	102	101	99	98	97	97	95
2	109	105	101	98	107	103	100	97	100	98	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	87	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	82	79	84	81	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.

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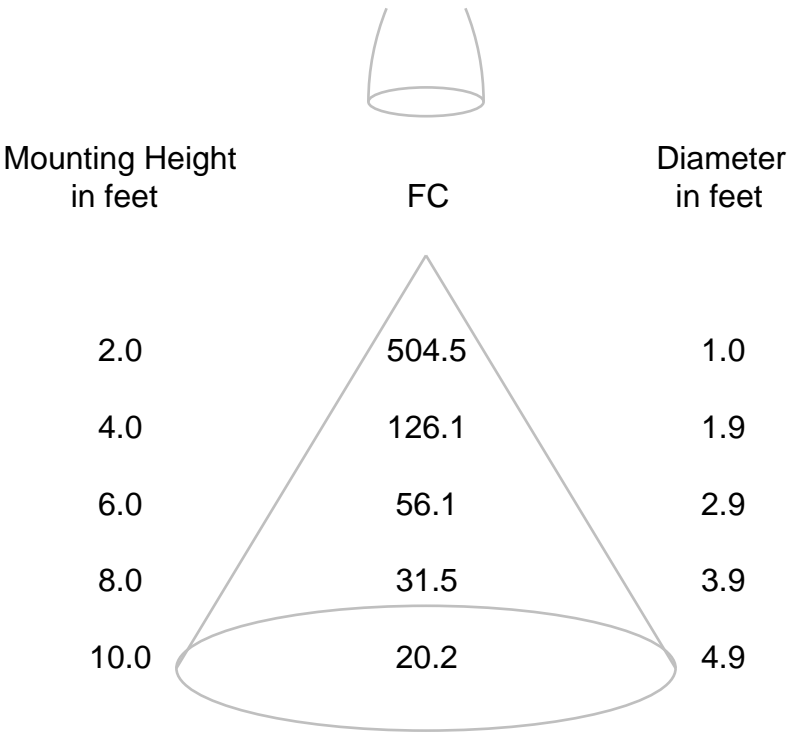
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# CONE OF LIGHT DIAGRAM

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



Note: The candela values used to generate this diagram were obtained by averaging the photometric data into a single plane.



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 CATALOG NUMBER: RDLED2S8-30N-TW (2" Square recessed downlight - medium beam)

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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:	GWINSTEK PROGRAMMABLE AC POWER SOURCE APS-7100	Calibration Due:
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	N/A
	OCEAN OPTICS QE65PRO Spectroradiometer	2/26/17
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	2/29/17

OBJECT OF TEST: Measure the Total Radiant Flux\*, Spectral Power Distribution (SPD),  
 Correlated Color Temperature (CCT), Color Rendering Indices (CRI<sub>a</sub>,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	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u> Lighting Engineer

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RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3871
Chromaticity Ordinate y	0.3844
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2264
Chromaticity Ordinate v'	0.5059
Correlated Color Temp CCT (K)	3881
Color Rendering Index (CRIa)	80
Color Rendering Index 1 (Light greyish red)	78
Color Rendering Index 2 (Dark greyish yellow)	85
Color Rendering Index 3 (Strong yellowish green)	90
Color Rendering Index 4 (Moderate yellowish green)	80
Color Rendering Index 5 (Light bluish green)	78
Color Rendering Index 6 (Light blue)	80
Color Rendering Index 7 (Light violet)	86
Color Rendering Index 8 (Light reddish purple)	64
Color Rendering Index 9 (Strong red)	5
Color Rendering Index 10 (Strong yellow)	64
Color Rendering Index 11 (Strong green)	78
Color Rendering Index 12 (Strong blue)	58
Color Rendering Index 13 (Light yellowish pink (skin))	79
Color Rendering Index 14 (Moderate olive green (leaf))	94
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	2243 *
ELECTRICAL FOR SPECTRORADIOMETRIC TEST	
Input Voltage (Volts AC )	120.0
Input Current (Amps AC )	0.071
Input Power (Watts)	8.26
Input Power Factor (%)	97.6
Input Current THD (%)	19.2
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

\*NOTE:

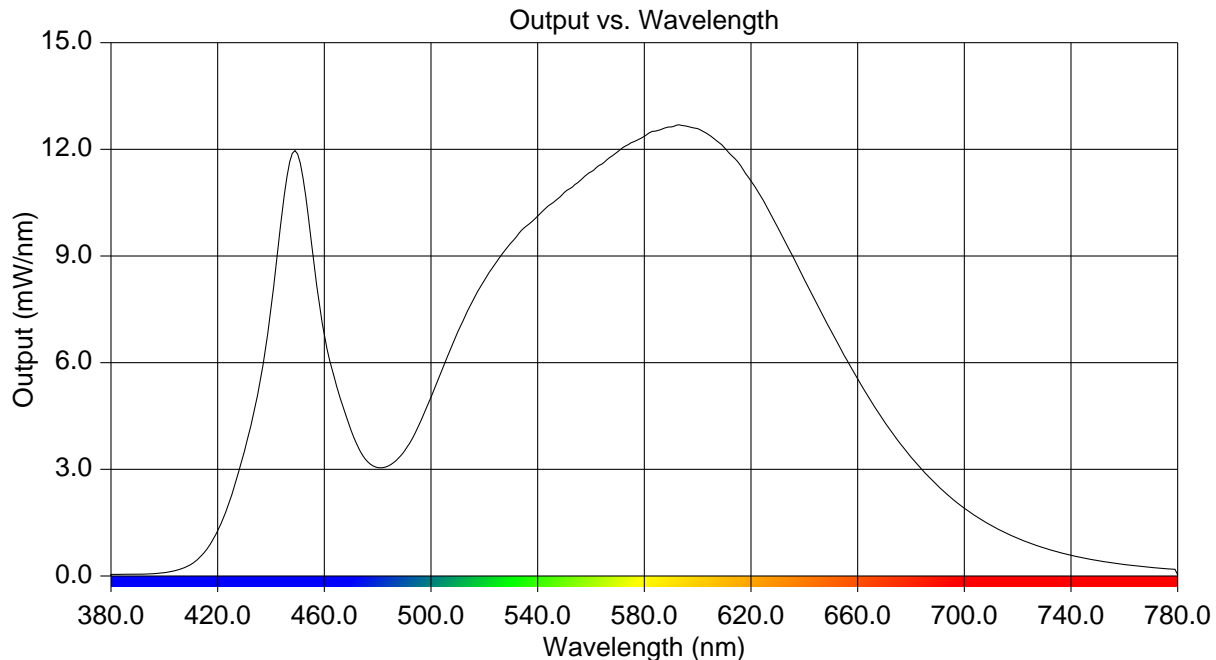
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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.

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### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.043	515	7.646	650	6.889
385	0.044	520	8.316	655	6.194
390	0.049	525	8.875	660	5.542
395	0.064	530	9.369	665	4.923
400	0.095	535	9.796	670	4.342
405	0.166	540	10.118	675	3.820
410	0.331	545	10.465	680	3.346
415	0.663	550	10.787	685	2.921
420	1.268	555	11.065	690	2.539
425	2.219	560	11.366	695	2.201
430	3.498	565	11.640	700	1.907
435	5.105	570	11.932	705	1.652
440	7.532	575	12.183	710	1.423
445	10.725	580	12.366	715	1.229
450	11.865	585	12.533	720	1.060
455	9.478	590	12.629	725	0.913
460	6.780	595	12.662	730	0.785
465	5.234	600	12.583	735	0.676
470	4.103	605	12.373	740	0.583
475	3.334	610	12.051	745	0.502
480	3.046	615	11.655	750	0.434
485	3.142	620	11.106	755	0.373
490	3.509	625	10.510	760	0.324
495	4.169	630	9.801	765	0.278
500	5.033	635	9.086	770	0.242
505	5.952	640	8.334	775	0.208
510	6.858	645	7.624	780	0.032



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## CIE Chromaticity Diagram

