RAB LIGHTING

NVLAP LAB CODE: 201058-0

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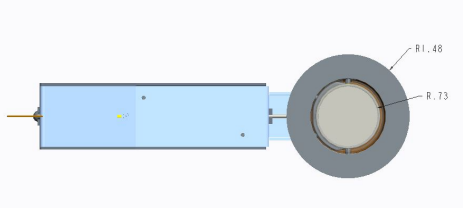
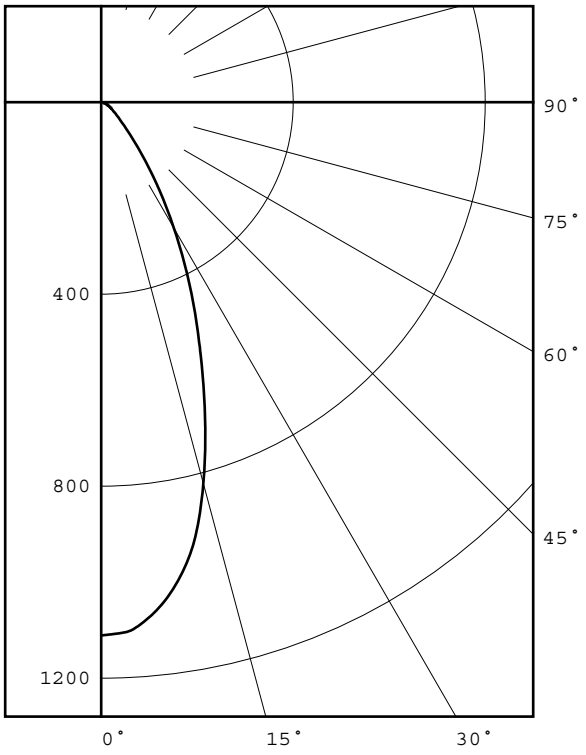
REPORT NUMBER: RAB02090 PAGE: 1 OF 8
ISSUE DATE: 06/16/16 DATE SAMPLE TESTED: 06/16/16
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2AR8-40YN-TW
LUMINAIRE: FABRICATED METAL UPPER HOUSING AND BALLAST HOUSING, CAST BLACK PAINTED FINNED METAL HEAT SINK, CAST WHITE PAINTED METAL GIMBAL,1 WHITE CIRCUIT BOARD WITH ONE LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, HOLOGRAPHIC FLAT PLASTIC LENS, CAST WHITE METAL LOWER HOUSING.
LAMP: ONE WHITE MULTI-CHIP LIGHT EMITTING DIODE (LED) WITH CLEAR HEMISPHERICAL INTEGRAL LENS, VERTICALBASE-UP POSITION.
NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
TOTAL INPUT WATTS: 8.302 W AT 120.0 VOLTS
(SEE PAGE 2 FOR MORE INFORMATION)



DEG	CANDELA	LUMENS
0	1111	
5	1082	100
15	823	226
25	449	206
35	188	120
45	64	52
55	29	27
65	16	16
75	9	9
85	3	3
90	0	



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	532	70.0
0- 40	652	85.8
0- 60	731	96.3
0- 90	760	100.0
90-180	0	0.0
0-180	760	100.0

TOTAL INPUT WATTS = 8.3
EFFICACY = 91.6 Lm/W
CIE TYPE - DIRECT
LUMINAIRE SPACING CRITERION = 0.7
LUMINOUS DIAMETER: 0.730

LUMINANCE DATA IN CANDELA/SQ METER

ANGLE IN DEG	AVERAGE
45	335069.
55	187174.
65	140156.
75	128732.
85	127428.

Checked	X.CAO
Approved	D.WANG-MUNSON

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ADDITIONAL INFORMATION

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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BEAM ANGLE (50%) : 43.6 DEGREES
FIELD ANGLE (10%): 79.7 DEGREES

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CANDELA DISTRIBUTION

	0.0
0.0	1111
2.5	1106
5.0	1082
7.5	1043
10.0	989
12.5	917
15.0	823
17.5	721
20.0	622
22.5	530
25.0	449
27.5	372
30.0	303
32.5	242
35.0	188
37.5	144
40.0	109
42.5	83
45.0	64
47.5	51
50.0	42
52.5	35
55.0	29
57.5	25
60.0	22
62.5	19
65.0	16
67.5	14
70.0	12
72.5	10
75.0	9
77.5	7
80.0	5
82.5	4
85.0	3
87.5	1
90.0	0

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ZONAL LUMEN SUMMARY

0- 5	26.
5- 10	74.
10- 15	108.
15- 20	118.
20- 25	111.
25- 30	94.
30- 35	71.
35- 40	49.
40- 45	31.
45- 50	21.
50- 55	15.
55- 60	12.
60- 65	9.
65- 70	7.
70- 75	5.
75- 80	4.
80- 85	2.
85- 90	1.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	26
5- 10	74
10- 15	108
15- 20	118
20- 25	111
25- 30	94
30- 35	71
35- 40	49
40- 45	31
45- 50	21
50- 55	15
55- 60	12
60- 65	9
65- 70	7
70- 75	5
75- 80	4
80- 85	2
85- 90	1
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	100
0- 20	326
0- 30	532
0- 40	652
0- 50	704
0- 60	731
0- 70	748
0- 80	757
0- 90	760
0-100	760
0-110	760
0-120	760
0-130	760
0-140	760
0-150	760
0-160	760
0-170	760
0-180	760

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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	113	110	107	105	111	108	105	103	104	102	100	100	99	97	97	95	94	93
2	107	102	98	94	105	100	96	93	97	94	91	94	91	89	91	89	87	85
3	102	95	90	85	99	93	89	85	91	87	83	88	85	82	86	83	81	79
4	96	88	83	78	94	87	82	78	85	81	77	83	79	76	81	78	75	74
5	91	83	77	72	90	82	76	72	80	75	71	78	74	71	77	73	70	69
6	87	78	72	67	85	77	71	67	76	70	67	74	70	66	73	69	66	64
7	83	73	67	63	81	73	67	63	71	66	63	70	66	62	69	65	62	60
8	79	69	63	59	78	69	63	59	68	63	59	67	62	59	66	61	58	57
9	75	66	60	56	74	65	60	56	64	59	56	63	59	55	63	58	55	54
10	72	62	57	53	71	62	56	53	61	56	53	60	56	52	60	55	52	51

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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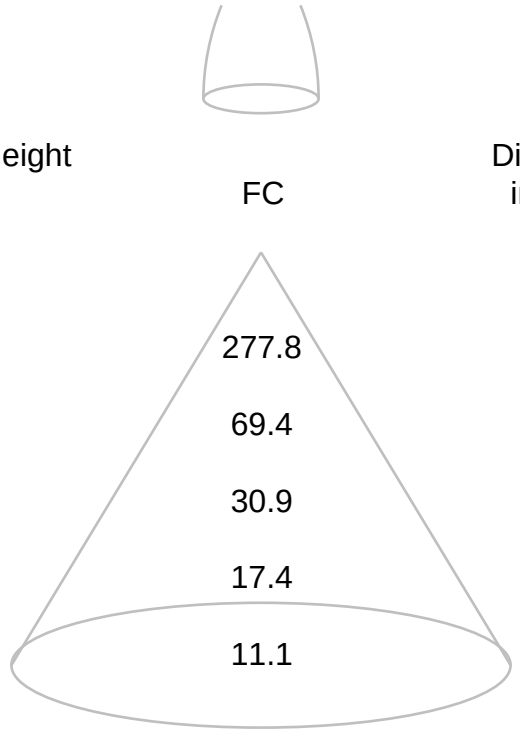
DATE SAMPLE TESTED: 06/16/16

CONE OF LIGHT DIAGRAM

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



Mounting Height in feet	FC	Diameter in feet
2.0	277.8	1.4
4.0	69.4	2.8
6.0	30.9	4.2
8.0	17.4	5.5
10.0	11.1	6.9

RAB LIGHTING

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DATE: 6/10/2016
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2AR8-40YN-TW

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

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

LAMP: ONE WHITE MULTI-CHIP LIGHT EMITTING DIODE (LED) WITH CLEAR HEMISPHERICAL INTEGRAL LENS, VERTICALBASE-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:		Calibration Due:
	GWINSTEK PROGRAMMABLE AC POWER SOURCE APS-7100	N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	2/26/17
	OCEAN OPTICS QE65PRO Spectroradiometer	5/31/17
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	5/31/17

OBJECT OF TEST: Measure the 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. 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

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RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4109
Chromaticity Ordinate y	0.3958
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2373
Chromaticity Ordinate v'	0.5142
Correlated Color Temp CCT (K)	3421
Color Rendering Index (CRIa)	82
Color Rendering Index 1 (Light greyish red)	80
Color Rendering Index 2 (Dark greyish yellow)	88
Color Rendering Index 3 (Strong yellowish green)	95
Color Rendering Index 4 (Moderate yellowish green)	82
Color Rendering Index 5 (Light bluish green)	81
Color Rendering Index 6 (Light blue)	85
Color Rendering Index 7 (Light violet)	86
Color Rendering Index 8 (Light reddish purple)	63
Color Rendering Index 9 (Strong red)	10
Color Rendering Index 10 (Strong yellow)	72
Color Rendering Index 11 (Strong green)	80
Color Rendering Index 12 (Strong blue)	65
Color Rendering Index 13 (Light yellowish pink (skin))	82
Color Rendering Index 14 (Moderate olive green (leaf))	97
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	2313 *
ELECTRICAL FOR SPECTRORADIOMETRIC TEST	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.071
Input Power (Watts)	8.30
Input Power Factor (%)	97.5
Input Current THD (%)	20.2
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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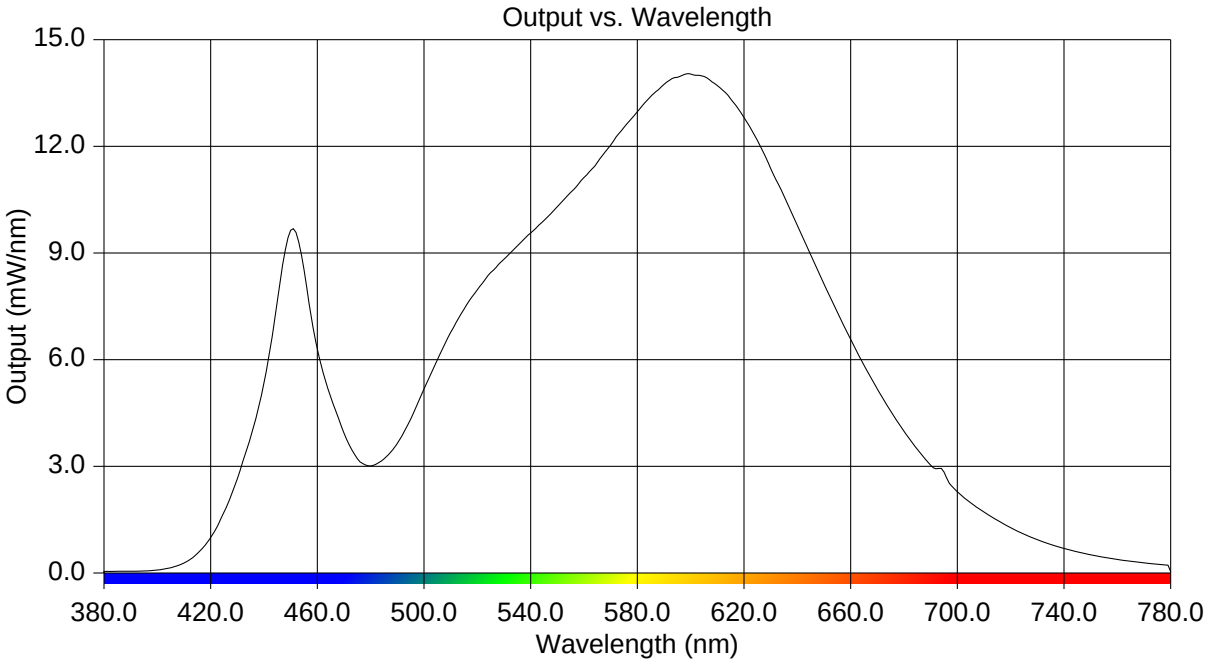
RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.043	515	7.419	650	8.123
385	0.043	520	7.965	655	7.329
390	0.048	525	8.449	660	6.568
395	0.058	530	8.820	665	5.842
400	0.086	535	9.195	670	5.176
405	0.146	540	9.563	675	4.559
410	0.284	545	9.914	680	3.989
415	0.547	550	10.297	685	3.473
420	0.998	555	10.704	690	3.031
425	1.712	560	11.123	695	2.841
430	2.649	565	11.546	700	2.283
435	3.838	570	12.035	705	1.973
440	5.347	575	12.533	710	1.711
445	7.663	580	12.972	715	1.484
450	9.639	585	13.399	720	1.274
455	8.536	590	13.742	725	1.088
460	6.283	595	13.941	730	0.936
465	4.965	600	14.034	735	0.803
470	3.932	605	13.966	740	0.687
475	3.216	610	13.709	745	0.592
480	3.010	615	13.332	750	0.513
485	3.208	620	12.811	755	0.441
490	3.642	625	12.186	760	0.380
495	4.326	630	11.378	765	0.330
500	5.173	635	10.600	770	0.285
505	5.984	640	9.774	775	0.246
510	6.769	645	8.947	780	0.037



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CIE Chromaticity Diagram