RAB LIGHTING

NVLAP LAB CODE: 201058-0

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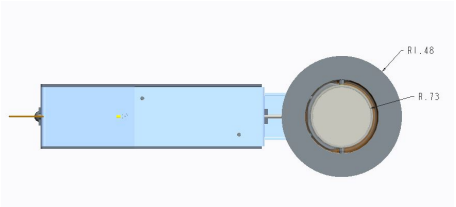
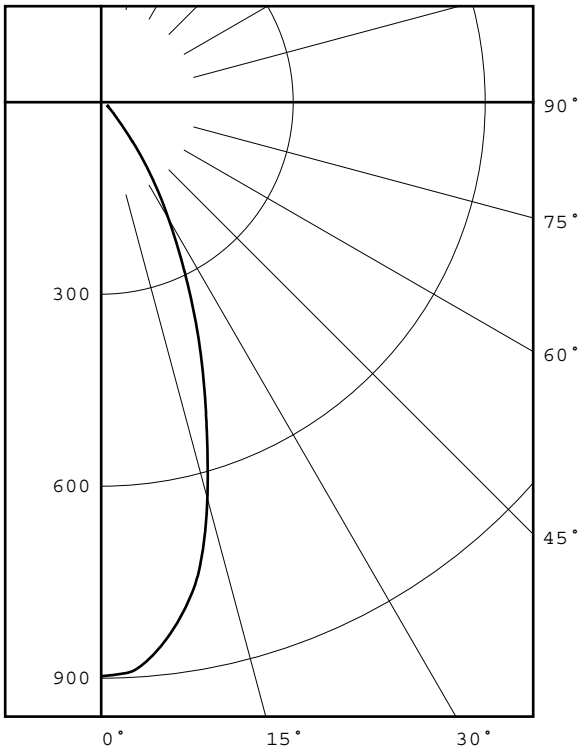
REPORT NUMBER: RAB02059 PAGE: 1 OF 8
ISSUE DATE: 06/08/16 DATE SAMPLE TESTED: 06/08/16
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2AR8-40YYHC-TW
LUMINAIRE: FABRICATED METAL UPPER HOUSING AND BALLAST HOUSING, CAST BLACK PAINTED FINNED METAL HEAT SINK, CAST WHITE PAINTED METAL GIMBAL,1 WHITE 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: 8.2426 W AT 120.0 VOLTS
(SEE PAGE 2 FOR MORE INFORMATION)



DEG	CANDELA	LUMENS
0	897	
5	872	81
15	641	176
25	326	150
35	126	80
45	33	28
55	15	14
65	9	9
75	5	5
85	2	2
90	0	



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	406	74.7
0- 40	486	89.3
0- 60	528	97.0
0- 90	544	100.0
90-180	0	0.0
0-180	544	100.0

TOTAL INPUT WATTS = 8.2
EFFICACY = 66.3 Lm/W
CIE TYPE - DIRECT
LUMINAIRE SPACING CRITERION = 0.7
LUMINOUS DIAMETER: 0.950

LUMINANCE DATA IN CANDELA/SQ METER

ANGLE IN DEG	AVERAGE
45	102016.
55	57166.
65	46551.
75	42229.
85	50162.

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%) : 41.5 DEGREES
FIELD ANGLE (10%): 75.2 DEGREES

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CANDELA DISTRIBUTION

	0.0
0.0	897
2.5	893
5.0	872
7.5	836
10.0	790
12.5	727
15.0	641
17.5	550
20.0	470
22.5	396
25.0	326
27.5	264
30.0	211
32.5	166
35.0	126
37.5	91
40.0	63
42.5	45
45.0	33
47.5	27
50.0	21
52.5	18
55.0	15
57.5	13
60.0	12
62.5	10
65.0	9
67.5	8
70.0	7
72.5	6
75.0	5
77.5	4
80.0	3
82.5	2
85.0	2
87.5	1
90.0	0

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ZONAL LUMEN SUMMARY

0- 5	21.
5- 10	59.
10- 15	85.
15- 20	91.
20- 25	83.
25- 30	67.
30- 35	49.
35- 40	31.
40- 45	17.
45- 50	11.
50- 55	8.
55- 60	6.
60- 65	5.
65- 70	4.
70- 75	3.
75- 80	2.
80- 85	1.
85- 90	1.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	21
5- 10	59
10- 15	85
15- 20	91
20- 25	83
25- 30	67
30- 35	49
35- 40	31
40- 45	17
45- 50	11
50- 55	8
55- 60	6
60- 65	5
65- 70	4
70- 75	3
75- 80	2
80- 85	1
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	81
0- 20	256
0- 30	406
0- 40	486
0- 50	514
0- 60	528
0- 70	537
0- 80	542
0- 90	544
0-100	544
0-110	544
0-120	544
0-130	544
0-140	544
0-150	544
0-160	544
0-170	544
0-180	544

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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	108	106	111	108	106	104	104	102	101	101	99	98	97	96	95	93
2	108	103	99	95	106	101	97	94	98	95	92	95	92	90	92	90	88	87
3	102	96	91	87	100	95	90	86	92	88	85	90	86	84	87	85	82	81
4	98	90	85	80	96	89	84	80	87	82	79	85	81	78	83	80	77	76
5	93	85	79	75	91	84	78	74	82	77	74	80	76	73	79	75	73	71
6	89	80	74	70	87	79	74	70	78	73	69	76	72	69	75	71	68	67
7	85	76	70	66	83	75	69	66	74	69	65	73	68	65	71	68	65	63
8	81	72	66	62	80	71	66	62	70	65	62	69	65	61	68	64	61	60
9	77	68	63	59	76	68	62	59	67	62	58	66	61	58	65	61	58	57
10	74	65	59	56	73	65	59	56	64	59	55	63	58	55	62	58	55	54

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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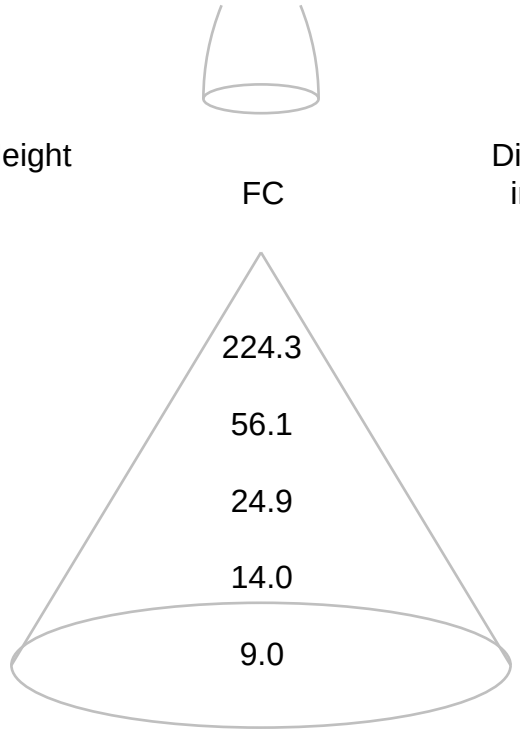
DATE SAMPLE TESTED: 06/08/16

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	224.3	1.3
4.0	56.1	2.6
6.0	24.9	4.0
8.0	14.0	5.3
10.0	9.0	6.6

RAB LIGHTING

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REPORT NUMBER: RAB02060
DATE: 6/7/2016
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2AR8-40YYHC-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	0.4654
Chromaticity Ordinate y	0.4118
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2655
Chromaticity Ordinate v'	0.5287
Correlated Color Temp CCT (K)	2633
Color Rendering Index (CRIa)	92
Color Rendering Index 1 (Light greyish red)	91
Color Rendering Index 2 (Dark greyish yellow)	95
Color Rendering Index 3 (Strong yellowish green)	98
Color Rendering Index 4 (Moderate yellowish green)	92
Color Rendering Index 5 (Light bluish green)	92
Color Rendering Index 6 (Light blue)	96
Color Rendering Index 7 (Light violet)	91
Color Rendering Index 8 (Light reddish purple)	79
Color Rendering Index 9 (Strong red)	55
Color Rendering Index 10 (Strong yellow)	89
Color Rendering Index 11 (Strong green)	92
Color Rendering Index 12 (Strong blue)	85
Color Rendering Index 13 (Light yellowish pink (skin))	92
Color Rendering Index 14 (Moderate olive green (leaf))	98
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	1946 *
ELECTRICAL FOR SPECTRORADIOMETRIC TEST	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.070
Input Power (Watts)	8.24
Input Power Factor (%)	97.8
Input Current THD (%)	18.1
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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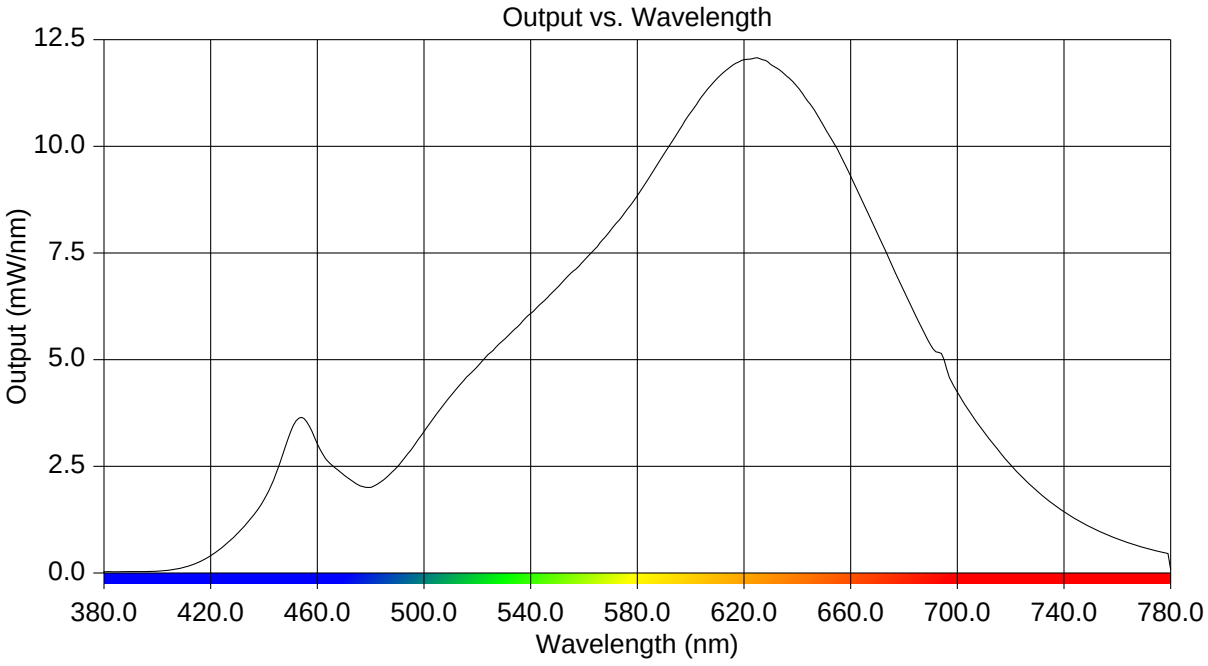
RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.027	515	4.518	650	10.465
385	0.029	520	4.841	655	9.937
390	0.033	525	5.168	660	9.294
395	0.033	530	5.468	665	8.647
400	0.044	535	5.766	670	7.960
405	0.070	540	6.082	675	7.278
410	0.131	545	6.375	680	6.601
415	0.239	550	6.686	685	5.957
420	0.405	555	7.022	690	5.343
425	0.635	560	7.327	695	5.006
430	0.918	565	7.650	700	4.233
435	1.273	570	8.033	705	3.742
440	1.718	575	8.418	710	3.302
445	2.408	580	8.841	715	2.909
450	3.313	585	9.326	720	2.533
455	3.621	590	9.822	725	2.204
460	3.026	595	10.306	730	1.917
465	2.555	600	10.799	735	1.659
470	2.295	605	11.233	740	1.432
475	2.074	610	11.596	745	1.239
480	2.007	615	11.866	750	1.077
485	2.190	620	12.029	755	0.927
490	2.487	625	12.076	760	0.800
495	2.872	630	11.920	765	0.690
500	3.310	635	11.703	770	0.593
505	3.746	640	11.395	775	0.513
510	4.157	645	10.977	780	0.077



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CIE Chromaticity Diagram