RAB LIGHTING

NVLAP LAB CODE: 201058-0

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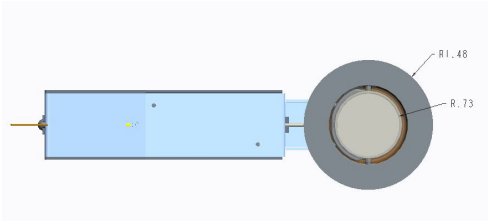
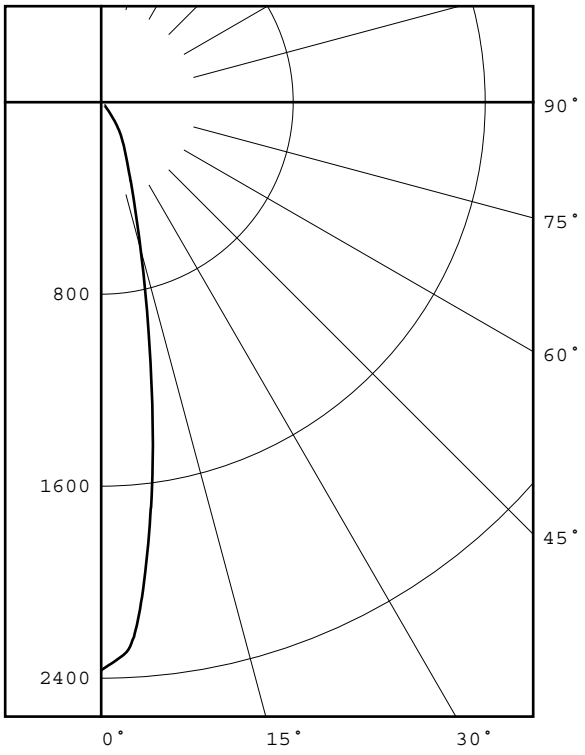
REPORT NUMBER: RAB02055 PAGE: 1 OF 8
ISSUE DATE: 06/08/16 DATE SAMPLE TESTED: 06/08/16
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2AR8-20YYHC-TW
LUMINAIRE: FABRICATED METAL UPPER HOUSING AND BALLAST HOUSING, CAST BLACK PAINTED FINNED METAL HEAT SINK, CAST WHITE PAINTED METAL GIMBAL,1 WHITE 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: 8.139 W AT 120.0 VOLTS
(SEE PAGE 2 FOR MORE INFORMATION)



DEG	CANDELA	LUMENS
0	2367	
5	2024	166
15	636	185
25	242	114
35	102	65
45	24	21
55	10	9
65	5	5
75	3	3
85	1	1
90	0	



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	465	81.6
0- 40	530	92.9
0- 60	560	98.2
0- 90	570	100.0
90-180	0	0.0
0-180	570	100.0

TOTAL INPUT WATTS = 8.1
EFFICACY = 70.4 Lm/W
CIE TYPE - DIRECT
LUMINAIRE SPACING CRITERION = 0.3
LUMINOUS DIAMETER: 0.950

LUMINANCE DATA IN CANDELA/SQ METER

ANGLE IN DEG	AVERAGE
45	74193.
55	38111.
65	25862.
75	25337.
85	25081.

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%) : 20.4 DEGREES
FIELD ANGLE (10%): 50.7 DEGREES

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CANDELA DISTRIBUTION

	0.0
0.0	2367
2.5	2300
5.0	2024
7.5	1620
10.0	1212
12.5	879
15.0	636
17.5	475
20.0	367
22.5	293
25.0	242
27.5	203
30.0	170
32.5	136
35.0	102
37.5	73
40.0	49
42.5	34
45.0	24
47.5	18
50.0	15
52.5	12
55.0	10
57.5	9
60.0	8
62.5	6
65.0	5
67.5	5
70.0	4
72.5	4
75.0	3
77.5	3
80.0	2
82.5	2
85.0	1
87.5	1
90.0	0

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ZONAL LUMEN SUMMARY

0- 5	53.
5- 10	113.
10- 15	105.
15- 20	80.
20- 25	62.
25- 30	52.
30- 35	40.
35- 40	25.
40- 45	13.
45- 50	8.
50- 55	5.
55- 60	4.
60- 65	3.
65- 70	2.
70- 75	2.
75- 80	1.
80- 85	1.
85- 90	0.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	53
5- 10	113
10- 15	105
15- 20	80
20- 25	62
25- 30	52
30- 35	40
35- 40	25
40- 45	13
45- 50	8
50- 55	5
55- 60	4
60- 65	3
65- 70	2
70- 75	2
75- 80	1
80- 85	1
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	166
0- 20	351
0- 30	465
0- 40	530
0- 50	550
0- 60	560
0- 70	565
0- 80	568
0- 90	570
0-100	570
0-110	570
0-120	570
0-130	570
0-140	570
0-150	570
0-160	570
0-170	570
0-180	570

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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	109	107	106	105	104	102	102	101	99	98	97	97	95
2	109	105	102	99	107	103	100	97	100	98	95	97	95	93	95	93	91	90
3	105	99	95	92	103	98	94	91	95	92	89	93	90	88	91	89	87	85
4	101	94	90	86	99	93	89	86	91	87	85	89	86	84	87	85	83	81
5	97	90	85	81	95	89	84	81	87	83	80	86	82	80	84	81	79	78
6	93	86	81	77	92	85	80	77	84	80	77	82	79	76	81	78	76	74
7	90	82	77	74	89	82	77	74	80	76	73	79	76	73	78	75	73	71
8	87	79	74	71	86	79	74	71	78	73	70	77	73	70	76	72	70	69
9	84	76	71	68	83	76	71	68	75	71	68	74	70	67	73	70	67	66
10	81	73	69	65	80	73	68	65	72	68	65	72	68	65	71	67	65	64

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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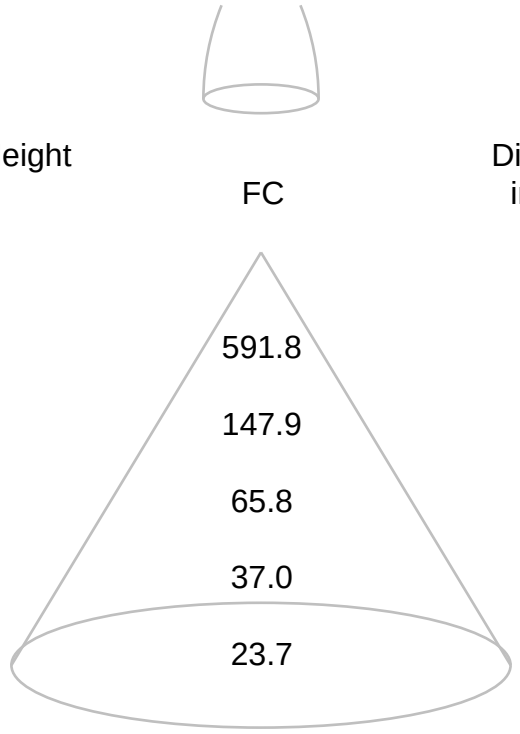
DATE SAMPLE TESTED: 06/08/16

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	591.8	0.7
4.0	147.9	1.4
6.0	65.8	2.1
8.0	37.0	2.8
10.0	23.7	3.5

RAB LIGHTING

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REPORT NUMBER: RAB02056
DATE: 6/7/2016
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: RDLED2AR8-20YYHC-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	0.4625
Chromaticity Ordinate y	0.4105
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2643
Chromaticity Ordinate v'	0.5277
Correlated Color Temp CCT (K)	2662
Color Rendering Index (CRIa)	92
Color Rendering Index 1 (Light greyish red)	92
Color Rendering Index 2 (Dark greyish yellow)	96
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)	56
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))	93
Color Rendering Index 14 (Moderate olive green (leaf))	98
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	2033 *
ELECTRICAL FOR SPECTRORADIOMETRIC TEST	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.070
Input Power (Watts)	8.14
Input Power Factor (%)	97.5
Input Current THD (%)	19.6
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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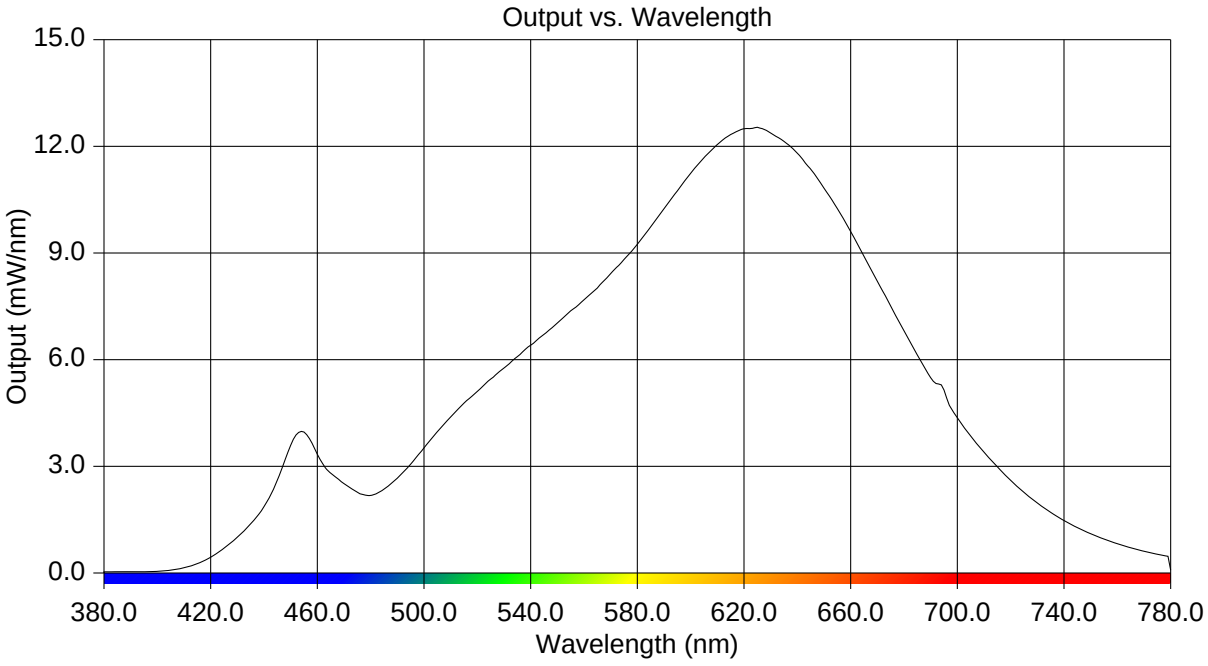
RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.032	515	4.778	650	10.823
385	0.034	520	5.110	655	10.249
390	0.032	525	5.454	660	9.604
395	0.036	530	5.764	665	8.918
400	0.047	535	6.085	670	8.204
405	0.078	540	6.407	675	7.504
410	0.146	545	6.710	680	6.811
415	0.263	550	7.029	685	6.136
420	0.443	555	7.373	690	5.493
425	0.698	560	7.688	695	5.147
430	1.002	565	8.014	700	4.361
435	1.385	570	8.417	705	3.848
440	1.868	575	8.817	710	3.394
445	2.607	580	9.240	715	2.988
450	3.591	585	9.738	720	2.605
455	3.965	590	10.248	725	2.264
460	3.339	595	10.745	730	1.966
465	2.810	600	11.245	735	1.706
470	2.513	605	11.674	740	1.473
475	2.266	610	12.050	745	1.275
480	2.177	615	12.332	750	1.106
485	2.359	620	12.492	755	0.953
490	2.664	625	12.536	760	0.824
495	3.061	630	12.369	765	0.709
500	3.519	635	12.139	770	0.612
505	3.969	640	11.804	775	0.528
510	4.394	645	11.362	780	0.080



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CIE Chromaticity Diagram