

REPORT NUMBER: RAB01683

ISSUE DATE: 01/29/16

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: RAIL95YNW/480

LUMINAIRE: EXTRUDED METAL HOUSING WITH HEAT SINK FINS, FOUR WHITE

CIRCUIT BOARD WITH SIXTY FOUR LEDS ON EACH BOARD, METAL REFLECTOR
WITH SPECULAR FINISH, FLAT TRANSLUCENT LENS WITH FROSTED SIDE IN.

LAMPS: TWO HUNDRED AND FIFTY SIX LIGHT EMITTING DIODES (LEDs).

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS = 92.562 W AT 480.0 VAC.

LED DRIVER: RD-H100-A2000-480

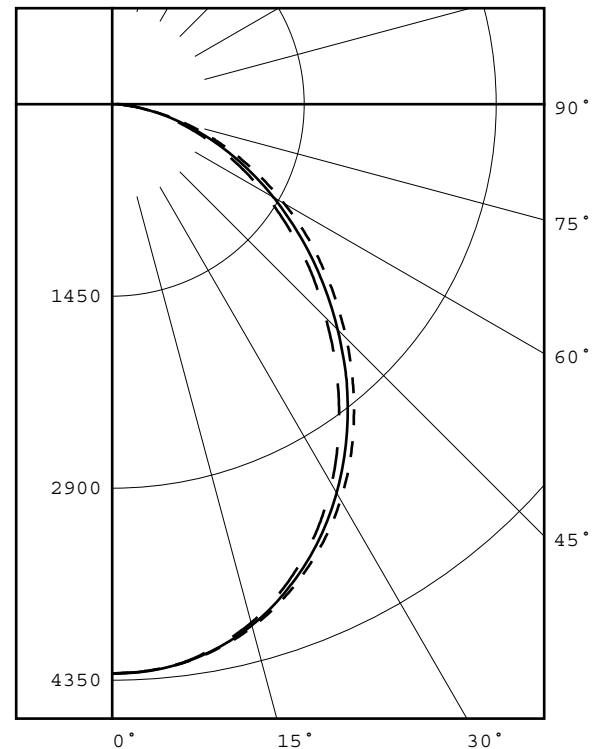
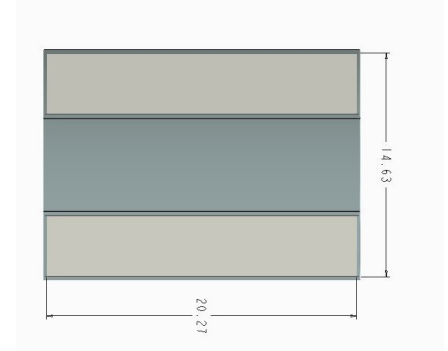
(SEE PAGE 2 FOR MORE INFORMATION)

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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	
0	4300	4300	4300	4300	4300	
5	4276	4280	4278	4274	4277	406
15	4088	4087	4074	4058	4054	1147
25	3704	3696	3662	3621	3606	1683
35	3157	3143	3084	3013	2984	1923
45	2500	2482	2410	2320	2282	1853
55	1834	1797	1729	1647	1624	1544
65	1179	1149	1100	1040	1018	1088
75	584	568	541	510	500	577
85	110	117	136	148	153	161
90	4	17	40	54	59	
95	0	0	1	5	7	9
105	0	0	0	1	1	0
115	1	1	1	1	1	1
125	1	1	1	1	1	1
135	1	1	1	1	1	1
145	2	2	2	2	2	1
155	2	2	2	2	2	1
165	2	2	2	3	3	1
175	3	3	3	3	3	0
180	3	3	3	3	3	

FLUX



LEGEND:

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

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	3236	31.1
0- 40	5159	49.6
0- 60	8555	82.3
0- 90	10382	99.9
90-120	10	0.1
90-130	11	0.1
90-150	13	0.1
90-180	15	0.1
0-180	10396	100.0

TOTAL INPUT WATTS = 92.6

EFFICACY = 112.3 Lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.2 1.2

Checked X.CAO
Approved D.WANG-MUNSON

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ADDITIONAL INFORMATION

TEST PROCEDURE: IESNA LM-79-08
TEST DISTANCE: 28.25 FEET
ACCREDITED LABORATORY CODE 201058-0
LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE

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PLANE : 0-DEG 90-DEG
BEAM ANGLE (50%) : 100.4 X 94.0 DEGREES
FIELD ANGLE (10%) : 155.9 X 153.2 DEGREES

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PLANE : 0-DEG 90-DEG
LUMINOUS LENGTH : 20.270 14.630

LUMINANCE DATA IN CANDELA/SQ METER

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	18473.	17808.	16862.
55	16706.	15750.	14794.
65	14576.	13599.	12586.
75	11789.	10921.	10094.
85	6594.	8153.	9172.

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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	4300	4300	4300	4300	4300
5.0	4276	4280	4278	4274	4277
10.0	4208	4210	4205	4195	4193
15.0	4088	4087	4074	4058	4054
20.0	3917	3913	3889	3861	3854
25.0	3704	3696	3662	3621	3606
30.0	3450	3439	3388	3335	3313
35.0	3157	3143	3084	3013	2984
40.0	2835	2823	2757	2670	2635
45.0	2500	2482	2410	2320	2282
50.0	2165	2137	2063	1981	1954
55.0	1834	1797	1729	1647	1624
60.0	1501	1467	1408	1334	1311
65.0	1179	1149	1100	1040	1018
70.0	872	848	811	761	746
75.0	584	568	541	510	500
80.0	324	318	310	298	294
85.0	110	117	136	148	153
90.0	4	17	40	54	59
95.0	0	0	1	5	7
100.0	0	0	0	0	1
105.0	0	0	0	1	1
110.0	0	0	0	1	1
115.0	1	1	1	1	1
120.0	0	0	1	1	1
125.0	1	1	1	1	1
130.0	1	1	1	1	1
135.0	1	1	1	1	1
140.0	1	1	1	2	2
145.0	2	2	2	2	2
150.0	2	2	2	2	2
155.0	2	2	2	2	2
160.0	2	2	2	2	2
165.0	2	2	2	3	3
170.0	2	2	3	3	3
175.0	3	3	3	3	3
180.0	3	3	3	3	3

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ZONAL LUMEN SUMMARY

0- 5	103.
5- 10	303.
10- 15	491.
15- 20	656.
20- 25	791.
25- 30	892.
30- 35	952.
35- 40	971.
40- 45	952.
45- 50	901.
50- 55	822.
55- 60	722.
60- 65	607.
65- 70	481.
70- 75	351.
75- 80	226.
80- 85	117.
85- 90	44.
90- 95	9.
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	1.
145-150	1.
150-155	1.
155-160	0.
160-165	0.
165-170	0.
170-175	0.
175-180	0.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	103
5- 10	303
10- 15	491
15- 20	656
20- 25	791
25- 30	892
30- 35	952
35- 40	971
40- 45	952
45- 50	901
50- 55	822
55- 60	722
60- 65	607
65- 70	481
70- 75	351
75- 80	226
80- 85	117
85- 90	44
90- 95	9
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	1
145-150	1
150-155	1
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	406
0- 20	1553
0- 30	3236
0- 40	5159
0- 50	7011
0- 60	8555
0- 70	9644
0- 80	10221
0- 90	10382
0-100	10391
0-110	10391
0-120	10392
0-130	10393
0-140	10393
0-150	10395
0-160	10396
0-170	10396
0-180	10396

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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	109	105	101	97	107	103	99	96	98	95	93	94	92	90	91	89	87	85
2	100	92	86	80	97	90	84	79	87	82	77	83	79	76	80	77	74	72
3	92	81	74	67	89	80	73	67	77	71	66	74	69	64	72	67	63	61
4	84	73	64	58	82	71	63	57	69	62	56	66	61	56	64	59	55	53
5	78	65	57	50	76	64	56	50	62	55	49	60	54	49	58	53	48	46
6	72	59	50	44	70	58	50	44	56	49	43	55	48	43	53	47	43	41
7	67	54	45	39	65	53	45	39	51	44	39	50	43	38	48	43	38	36
8	62	49	41	35	61	48	41	35	47	40	35	46	39	35	45	39	34	32
9	58	45	37	32	57	45	37	32	43	36	31	42	36	31	41	35	31	29
10	55	42	34	29	53	41	34	29	40	33	29	39	33	29	38	33	28	27

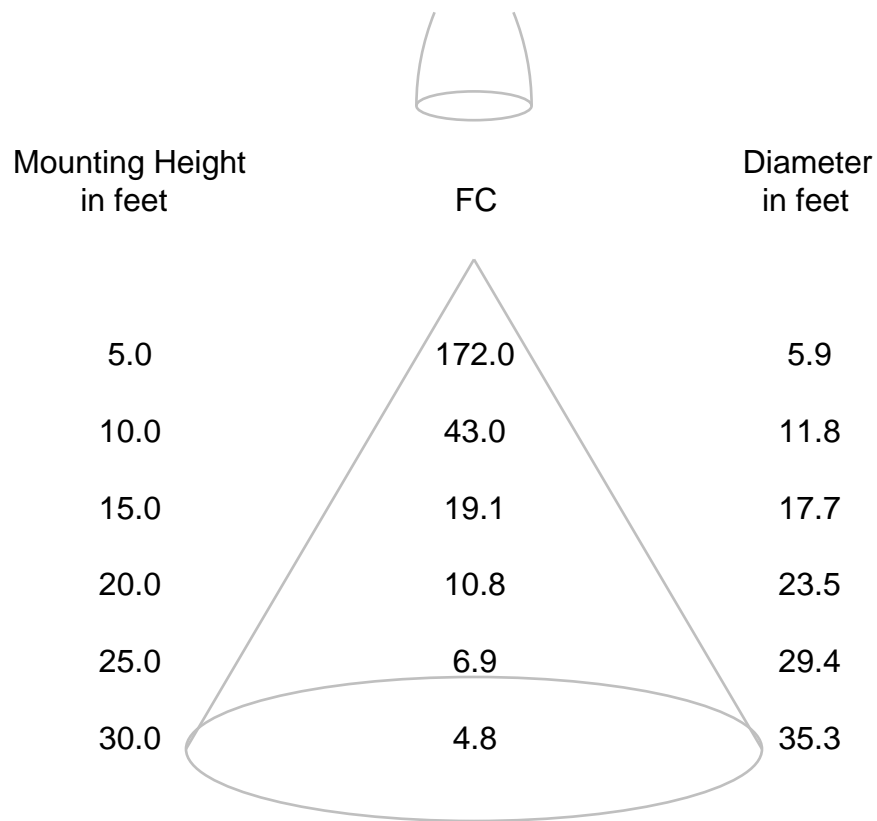
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE
BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES
ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

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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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ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: EXTRUDED METAL HOUSING WITH HEAT SINK FINS, FOUR WHITE CIRCUIT BOARD WITH SIXTY FOUR LEDS ON EACH BOARD, METAL REFLECTOR WITH SPECULAR FINISH, FLAT TRANSLUCENT LENS WITH FROSTED SIDE IN.

LAMP: TWO HUNDRED AND FIFTY SIX LIGHT EMITTING DIODES (LEDS).

DRIVER: RD-H100-A2000-480

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (480.0 AND 347.0 VAC, 60Hz) TO THE TEST SAMPLE.

INSTRUMENTS:	GWINSTEK PROGRAMMABLE AC POWER SOURCE APS-7100	Calibration Due: N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	3/9/16
	OCEAN OPTICS QE65PRO Spectroradiometer	1/25/17
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	1/25/17

OBJECT OF TEST: Measure the Absolute Flux in lumens*, 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. Measure electrical data including Total Harmonic Distortion (THD) at maximum nominal rated input voltage. Report Off-State Power.

PROCEDURE: The test sample was mounted inside the integrating sphere, energized, 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 60 HZ input in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. Electrical data was also recorded at maximum nominal rated input voltage (347.0 VAC). 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:

PHOTOMETRIC	
Total Integrated Flux (lumens)	10396 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4054
Chromaticity Ordinate y	0.3890
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2365
Chromaticity Ordinate v'	0.5106
Correlated Color Temp CCT (K)	3483
ANSI C78.377-2008 Duv	-0.001
Total Radiant Flux (milliWatts)	32445 *
ELECTRICAL	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.211
Input Power (Watts)	92.6
Input Power Factor (%)	91.5
Input Current THD (%)	10.8
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	112.3
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.269
Input Power (Watts)	91.2
Input Power Factor (%)	97.5
Input Current THD (%)	9.0
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	81
R2 Dark greyish yellow	87
R3 Strong yellowish green	92
R4 Moderate yellowish green	82
R5 Light bluish green	80
R6 Light blue	82
R7 Light violet	86
R8 Light reddish purple	67
R9 Strong red	17
R10 Strong yellow	69
R11 Strong green	80
R12 Strong blue	62
R13 Light yellowish pink (skin)	82
R14 Moderate olive green (leaf)	95

*NOTE:

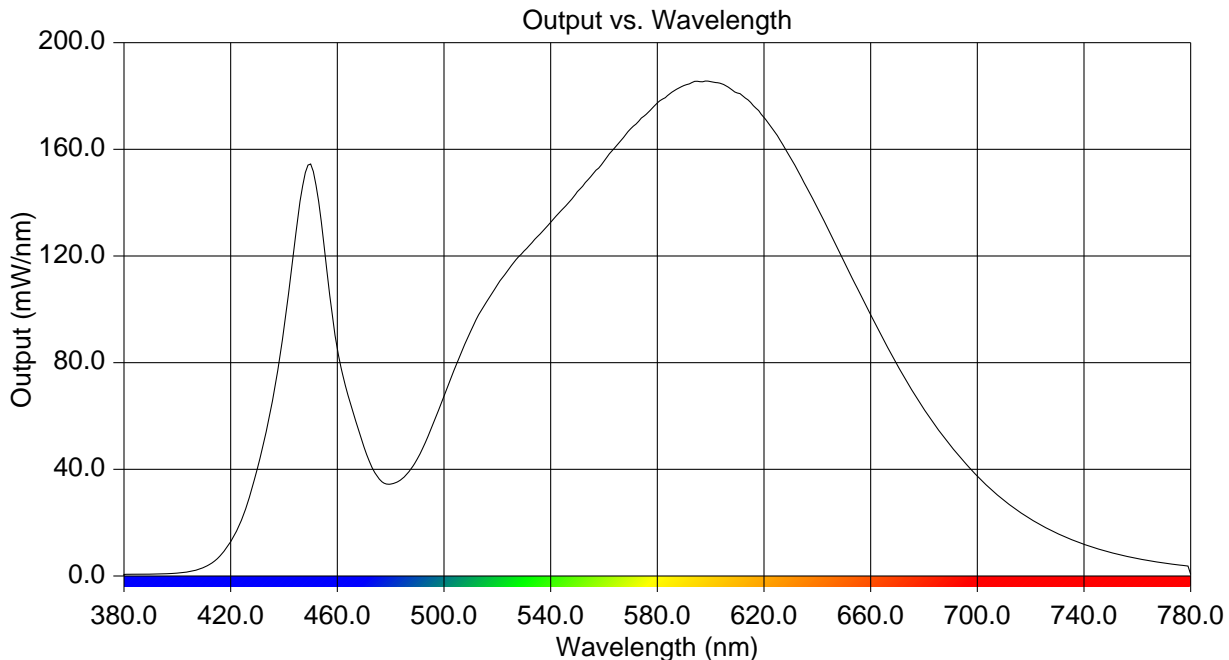
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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	0.578	515	101.242	650	117.897
385	0.656	520	109.143	655	107.906
390	0.724	525	116.066	660	97.910
395	0.810	530	121.845	665	88.373
400	1.089	535	127.233	670	79.207
405	1.720	540	132.614	675	70.605
410	3.252	545	138.049	680	62.638
415	6.490	550	144.115	685	55.292
420	12.777	555	149.718	690	48.737
425	23.574	560	155.542	695	42.909
430	40.236	565	161.705	700	37.454
435	62.246	570	167.713	705	32.630
440	92.303	575	172.449	710	28.364
445	133.221	580	177.400	715	24.581
450	154.499	585	181.201	720	21.328
455	124.113	590	183.935	725	18.491
460	85.102	595	185.526	730	15.968
465	64.484	600	185.385	735	13.764
470	48.364	605	184.258	740	11.902
475	37.348	610	181.123	745	10.226
480	34.467	615	177.594	750	8.825
485	37.063	620	171.934	755	7.555
490	43.929	625	165.176	760	6.568
495	54.732	630	156.716	765	5.652
500	67.615	635	147.553	770	4.882
505	80.089	640	138.089	775	4.178
510	91.774	645	128.125	780	0.631



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CIE Chromaticity Diagram

