

REPORT NUMBER: RAB01685

ISSUE DATE: 01/29/16

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: RAIL150W/480

LUMINAIRE: EXTRUDED METAL HOUSING WITH HEAT SINK FINS, FOUR WHITE
CIRCUIT BOARD WITH NINETY SIX LEDS ON EACH BOARD, METAL REFLECTOR
WITH SPECULAR FINISH, FLAT TRANSLUCENT LENS WITH FROSTED SIDE IN.
LAMPS: THREE HUNDRED AND EIGHTY FOUR LIGHT EMITTING DIODES (LEDs).

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS = 147.0 W AT 480.0 VAC.

LED DRIVER: 2 x RD-S075-A1400/480

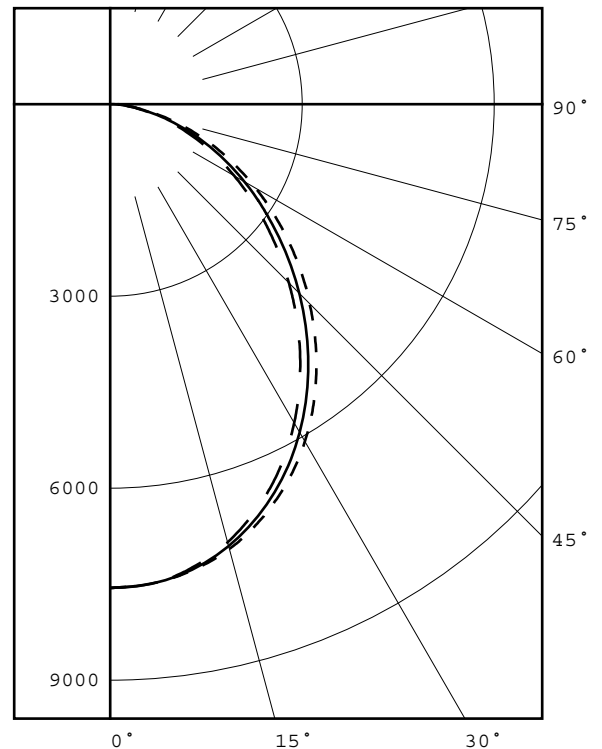
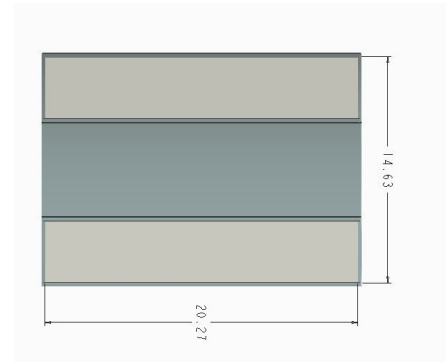
(SEE PAGE 2 FOR MORE INFORMATION)

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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	
0	7558	7558	7558	7558	7558	
5	7517	7522	7518	7511	7513	713
15	7195	7190	7150	7107	7088	2012
25	6529	6506	6408	6316	6275	2947
35	5569	5529	5373	5244	5172	3361
45	4406	4358	4179	4032	3948	3230
55	3211	3142	2978	2851	2776	2679
65	2060	2009	1886	1796	1731	1883
75	1026	993	929	883	851	997
85	187	207	236	262	264	281
90	8	32	70	100	107	
95	0	0	0	9	13	16
105	0	0	0	1	1	0
115	0	0	0	1	1	0
125	0	1	1	1	1	1
135	1	1	2	2	2	1
145	2	2	2	3	3	1
155	3	3	3	3	3	1
165	3	3	4	4	4	1
175	4	4	4	5	5	0
180	5	5	5	5	5	

FLUX



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

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	5673	31.3
0- 40	9034	49.8
0- 60	14942	82.4
0- 90	18103	99.9
90-120	17	0.1
90-130	18	0.1
90-150	20	0.1
90-180	23	0.1
0-180	18127	100.0

TOTAL INPUT WATTS = 147.0

EFFICACY = 123.3 Lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.2 1.1

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%) : 100.6 X 92.8 DEGREES
FIELD ANGLE (10%) : 155.7 X 152.6 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	32556.	30879.	29172.
55	29250.	27128.	25287.
65	25468.	23317.	21401.
75	20712.	18754.	17179.
85	11210.	14148.	15827.

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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	7558	7558	7558	7558	7558
5.0	7517	7522	7518	7511	7513
10.0	7395	7401	7382	7358	7354
15.0	7195	7190	7150	7107	7088
20.0	6898	6886	6815	6749	6722
25.0	6529	6506	6408	6316	6275
30.0	6085	6054	5920	5809	5751
35.0	5569	5529	5373	5244	5172
40.0	5002	4958	4786	4645	4564
45.0	4406	4358	4179	4032	3948
50.0	3813	3747	3569	3429	3347
55.0	3211	3142	2978	2851	2776
60.0	2625	2559	2420	2305	2236
65.0	2060	2009	1886	1796	1731
70.0	1522	1488	1389	1315	1264
75.0	1026	993	929	883	851
80.0	562	545	524	517	497
85.0	187	207	236	262	264
90.0	8	32	70	100	107
95.0	0	0	0	9	13
100.0	0	0	0	0	0
105.0	0	0	0	1	1
110.0	0	0	1	1	1
115.0	0	0	0	1	1
120.0	0	0	1	1	1
125.0	0	1	1	1	1
130.0	1	1	1	1	1
135.0	1	1	2	2	2
140.0	2	2	2	2	2
145.0	2	2	2	3	3
150.0	3	3	3	3	3
155.0	3	3	3	3	3
160.0	3	3	3	3	4
165.0	3	3	4	4	4
170.0	4	4	4	4	5
175.0	4	4	4	5	5
180.0	5	5	5	5	5

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ZONAL LUMEN SUMMARY

0- 5	180.
5- 10	533.
10- 15	862.
15- 20	1151.
20- 25	1387.
25- 30	1561.
30- 35	1664.
35- 40	1696.
40- 45	1662.
45- 50	1568.
50- 55	1427.
55- 60	1251.
60- 65	1050.
65- 70	833.
70- 75	608.
75- 80	389.
80- 85	204.
85- 90	78.
90- 95	16.
95-100	1.
100-105	0.
105-110	0.
110-115	0.
115-120	0.
120-125	0.
125-130	0.
130-135	0.
135-140	1.
140-145	1.
145-150	1.
150-155	1.
155-160	1.
160-165	1.
165-170	0.
170-175	0.
175-180	0.

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	180
5- 10	533
10- 15	862
15- 20	1151
20- 25	1387
25- 30	1561
30- 35	1664
35- 40	1696
40- 45	1662
45- 50	1568
50- 55	1427
55- 60	1251
60- 65	1050
65- 70	833
70- 75	608
75- 80	389
80- 85	204
85- 90	78
90- 95	16
95-100	1
100-105	0
105-110	0
110-115	0
115-120	0
120-125	0
125-130	0
130-135	0
135-140	1
140-145	1
145-150	1
150-155	1
155-160	1
160-165	1
165-170	0
170-175	0
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	713
0- 20	2726
0- 30	5673
0- 40	9034
0- 50	12264
0- 60	14942
0- 70	16825
0- 80	17822
0- 90	18103
0-100	18120
0-110	18120
0-120	18121
0-130	18121
0-140	18122
0-150	18124
0-160	18125
0-170	18126
0-180	18127

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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	84	79	76	80	77	74	72
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	72	67	63	61
4	84	73	64	58	82	71	64	57	69	62	57	67	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	44	55	48	43	53	47	43	41
7	67	54	45	39	65	53	45	39	51	44	39	50	43	39	49	43	38	36
8	62	49	41	35	61	49	41	35	47	40	35	46	39	35	45	39	34	33
9	58	45	37	32	57	45	37	32	44	37	32	42	36	31	41	36	31	29
10	55	42	34	29	54	41	34	29	40	34	29	39	33	29	39	33	29	27

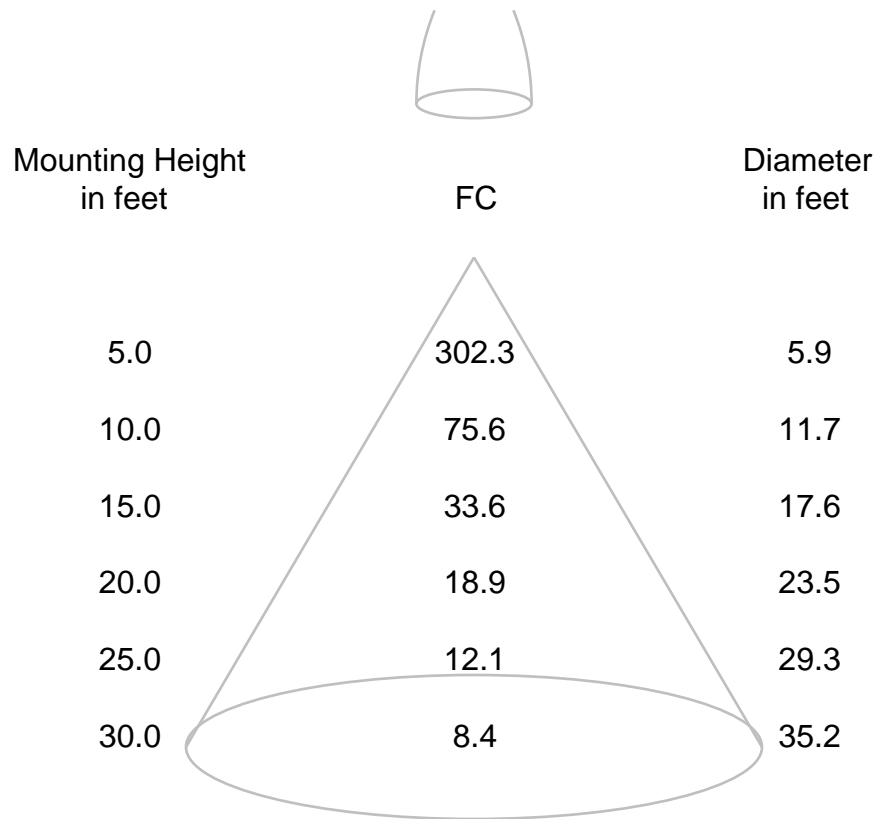
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE
BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES
ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

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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.

REPORT NUMBER: RAB01686
 DATE: 1/28/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: RAIL150W/480

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

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

LAMP: THREE HUNDRED AND EIGHTY FOUR LIGHT EMITTING DIODES (LEDS).

DRIVER: 2 x RD-S075-A1400/480

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	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u> Lighting Engineer

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	18127 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3459
Chromaticity Ordinate y	0.3552
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2106
Chromaticity Ordinate v'	0.4865
Correlated Color Temp CCT (K)	4982
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	54636 *
ELECTRICAL	
Input Voltage (Volts AC)	480.0
Input Current (Amps AC)	0.338
Input Power (Watts)	147.0
Input Power Factor (%)	90.6
Input Current THD (%)	17.7
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	123.3
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	347.0
Input Current (Amps AC)	0.426
Input Power (Watts)	146.1
Input Power Factor (%)	98.9
Input Current THD (%)	11.8
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	74
R1 Light greyish red	72
R2 Dark greyish yellow	79
R3 Strong yellowish green	83
R4 Moderate yellowish green	75
R5 Light bluish green	73
R6 Light blue	70
R7 Light violet	83
R8 Light reddish purple	61
R9 Strong red	-18
R10 Strong yellow	49
R11 Strong green	72
R12 Strong blue	44
R13 Light yellowish pink (skin)	73
R14 Moderate olive green (leaf)	90

*NOTE:

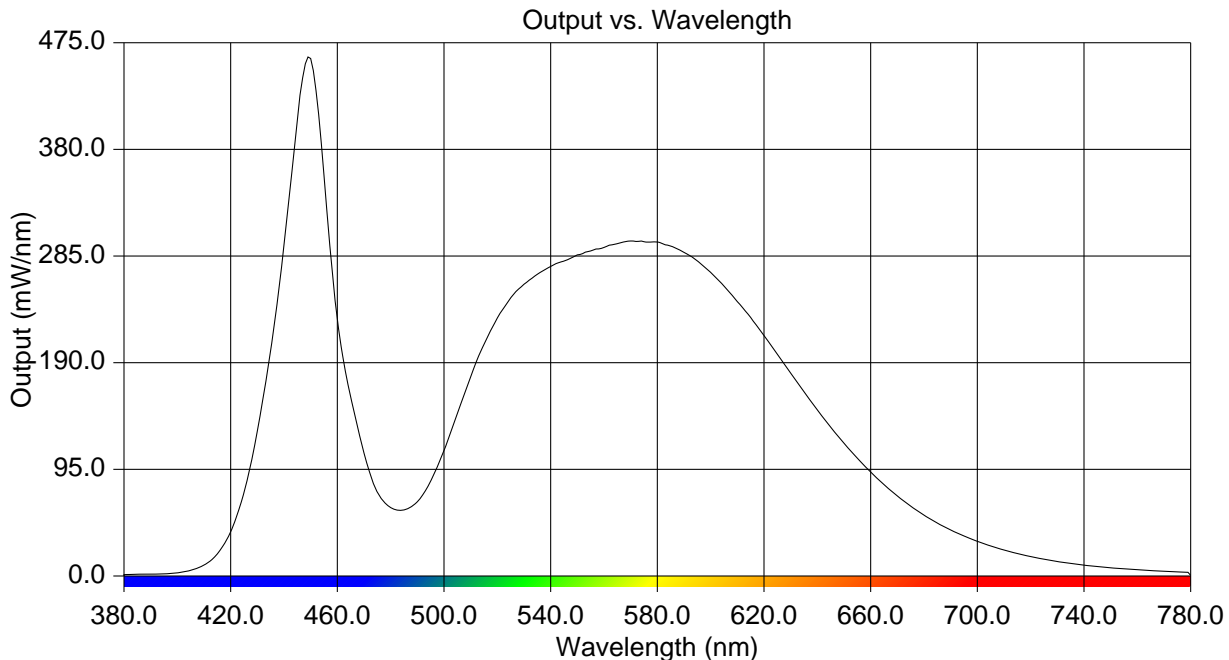
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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	1.168	515	206.404	650	118.113
385	1.391	520	229.779	655	104.945
390	1.582	525	247.681	660	92.639
395	1.935	530	259.844	665	81.456
400	2.946	535	268.718	670	71.317
405	4.873	540	275.638	675	62.268
410	9.737	545	280.501	680	54.265
415	19.667	550	286.006	685	47.066
420	39.358	555	289.504	690	40.936
425	74.413	560	292.613	695	35.649
430	129.118	565	295.986	700	30.820
435	201.440	570	298.364	705	26.666
440	291.984	575	297.724	710	23.114
445	408.613	580	297.541	715	19.939
450	460.900	585	294.080	720	17.242
455	356.678	590	288.212	725	14.995
460	228.511	595	280.699	730	12.953
465	159.665	600	270.349	735	11.182
470	109.476	605	258.201	740	9.725
475	75.061	610	244.341	745	8.405
480	60.982	615	230.278	750	7.300
485	58.818	620	214.322	755	6.329
490	66.108	625	197.900	760	5.537
495	84.291	630	180.790	765	4.795
500	112.092	635	163.780	770	4.173
505	144.333	640	147.981	775	3.639
510	177.353	645	132.607	780	0.556



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CIE Chromaticity Diagram

