

REPORT NUMBER: RAB00901

ISSUE DATE: 05/26/15

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: FALCORA160NW

LUMINAIRE: ONE LUMINAIRE CONSISTING OF TWO PAIRS OF HEADS. EACH PAIR MOUNTED IN OPPOSING DIRECTIONS, EACH LIGHT HEAD CONSISTING OF: CAST FINNED METAL HOUSING, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, ONE CIRCUIT BOARD WITH 16 LEDS, CLEAR FLAT PRISMATIC GLASS LENS.

(SEE PAGE 2 FOR MORE INFORMATION)

PAGE: 1 OF 8

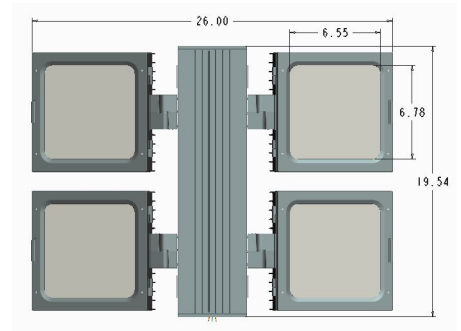
DATE SAMPLE TESTED: 05/26/15

CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0	13688	13688	13688	13688	13688
5	12850	12974	13197	13451	13575
15	6621	7081	8656	11694	13117
25	3343	3728	5077	8438	11979
35	849	1199	2650	5440	9944
45	242	357	981	3390	7845
55	119	153	368	1936	5730
65	82	99	177	865	3593
75	48	60	93	325	1797
85	12	22	50	143	646
90	0	11	34	92	306
95	0	3	14	52	121
105	0	2	0	0	0
115	0	2	0	0	0
125	0	2	0	0	0
135	0	3	1	0	0
145	1	4	4	1	0
155	3	6	4	0	0
165	5	8	4	0	0
175	6	9	5	0	0
180	4	4	4	4	4

FLUX

1200
2611
2849
2322
1711
1208
746
379
154
38
1
0
0
0
1
1
1
1
0



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	6660	50.4
0- 40	8982	67.9
0- 60	11901	90.0
0- 90	13180	99.7
90-120	40	0.3
90-130	41	0.3
90-150	43	0.3
90-180	46	0.3
0-180	13226	100.0

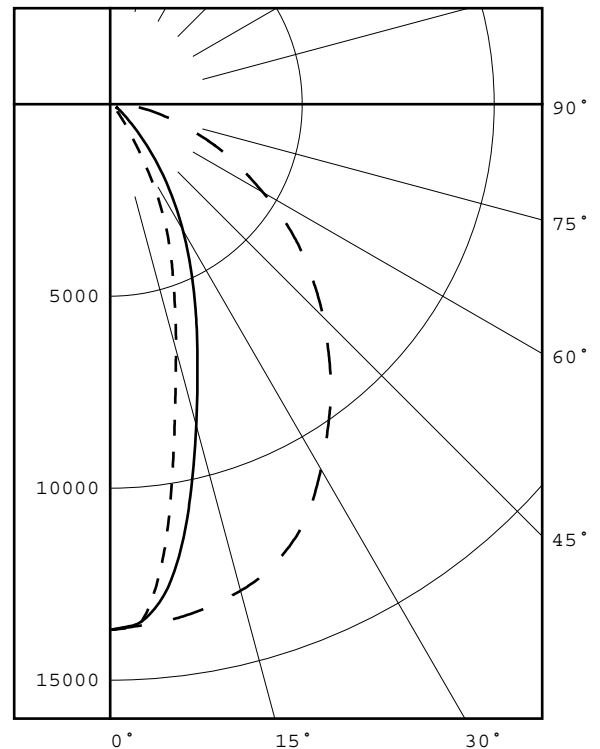
TOTAL INPUT WATTS = 159.5

EFFICACY = 82.9 Lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 0.5 1.2



LEGEND:

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

Checked

X.CAO

Approved

D.WANG-MUNSON

REPORT NUMBER: RAB00901
ISSUE DATE: 05/26/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 2 OF 8
DATE SAMPLE TESTED: 05/26/15

ADDITIONAL INFORMATION

LAMPS: SIXTY-FOUR WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), TILTED
15-DEGREES FROM VERTICAL BASE-UP POSITION.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS =159.47 AT 120.0 VAC.

LED DRIVER: RD-144-Q0700-R

TEST PROCEDURE: IESNA LM-79-08

ACCREDITED LABORATORY CODE 201058-0

REPORT NUMBER: RAB00901
ISSUE DATE: 05/26/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 3 OF 8
DATE SAMPLE TESTED: 05/26/15

PLANE : 0-DEG 90-DEG
BEAM ANGLE (50%) : 29.1 X 99.4 DEGREES
FIELD ANGLE (10%): 64.0 X 156.5 DEGREES

REPORT NUMBER: RAB00901
 ISSUE DATE: 05/26/15
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 4 OF 8
 DATE SAMPLE TESTED: 05/26/15

CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	13688	13688	13688	13688	13688
5.0	12850	12974	13197	13451	13575
10.0	9438	9947	11255	12813	13394
15.0	6621	7081	8656	11694	13117
20.0	4775	5192	6626	10144	12677
25.0	3343	3728	5077	8438	11979
30.0	1853	2360	3785	6826	10977
35.0	849	1199	2650	5440	9944
40.0	436	623	1700	4329	8902
45.0	242	357	981	3390	7845
50.0	157	217	571	2611	6777
55.0	119	153	368	1936	5730
60.0	99	120	248	1359	4594
65.0	82	99	177	865	3593
70.0	65	80	133	526	2628
75.0	48	60	93	325	1797
80.0	29	39	64	213	1155
85.0	12	22	50	143	646
90.0	0	11	34	92	306
95.0	0	3	14	52	121
100.0	0	2	0	9	29
105.0	0	2	0	0	0
110.0	0	2	0	0	0
115.0	0	2	0	0	0
120.0	0	2	0	0	0
125.0	0	2	0	0	0
130.0	0	2	0	0	0
135.0	0	3	1	0	0
140.0	0	3	3	1	0
145.0	1	4	4	1	0
150.0	2	5	4	1	0
155.0	3	6	4	0	0
160.0	4	7	4	0	0
165.0	5	8	4	0	0
170.0	5	8	4	0	0
175.0	6	9	5	0	0
180.0	4	4	4	4	4

REPORT NUMBER: RAB00901
ISSUE DATE: 05/26/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 5 OF 8
DATE SAMPLE TESTED: 05/26/15

ZONAL LUMEN SUMMARY

0- 5	322.
5- 10	878.
10- 15	1217.
15- 20	1393.
20- 25	1452.
25- 30	1397.
30- 35	1245.
35- 40	1077.
40- 45	925.
45- 50	786.
50- 55	663.
55- 60	545.
60- 65	427.
65- 70	319.
70- 75	226.
75- 80	153.
80- 85	98.
85- 90	56.
90- 95	28.
95-100	10.
100-105	1.
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	1.
160-165	1.
165-170	0.
170-175	0.
175-180	0.

REPORT NUMBER: RAB00901
 ISSUE DATE: 05/26/15
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 6 OF 8
 DATE SAMPLE TESTED: 05/26/15

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	322
5- 10	878
10- 15	1217
15- 20	1393
20- 25	1452
25- 30	1397
30- 35	1245
35- 40	1077
40- 45	925
45- 50	786
50- 55	663
55- 60	545
60- 65	427
65- 70	319
70- 75	226
75- 80	153
80- 85	98
85- 90	56
90- 95	28
95-100	10
100-105	1
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	1
160-165	1
165-170	0
170-175	0
175-180	0

10-DEGREE ZONAL LUMEN SUMMARY

0- 10	1200
0- 20	3811
0- 30	6660
0- 40	8982
0- 50	10693
0- 60	11901
0- 70	12647
0- 80	13026
0- 90	13180
0-100	13218
0-110	13220
0-120	13220
0-130	13221
0-140	13222
0-150	13223
0-160	13224
0-170	13225
0-180	13226

REPORT NUMBER: RAB00901
ISSUE DATE: 05/26/15

PAGE: 7 OF 8
DATE SAMPLE TESTED: 05/26/15

PREPARED FOR: RAB LIGHTING INC.

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	111	107	104	101	109	105	102	99	101	99	96	97	95	93	94	92	91	89
2	104	97	92	87	101	95	91	86	92	88	84	89	85	82	86	83	81	79
3	97	88	82	77	94	87	81	76	84	79	75	81	77	74	79	75	72	70
4	90	81	74	68	88	80	73	68	77	72	67	75	70	66	73	69	65	64
5	85	74	67	62	83	73	66	61	71	65	61	69	64	60	68	63	60	58
6	80	69	61	56	78	68	61	56	66	60	55	65	59	55	63	58	55	53
7	75	64	57	51	73	63	56	51	62	55	51	60	55	51	59	54	50	49
8	71	59	52	47	69	59	52	47	58	51	47	56	51	47	55	50	47	45
9	67	56	49	44	66	55	49	44	54	48	44	53	48	44	52	47	43	42
10	64	52	46	41	62	52	45	41	51	45	41	50	45	41	49	44	41	39

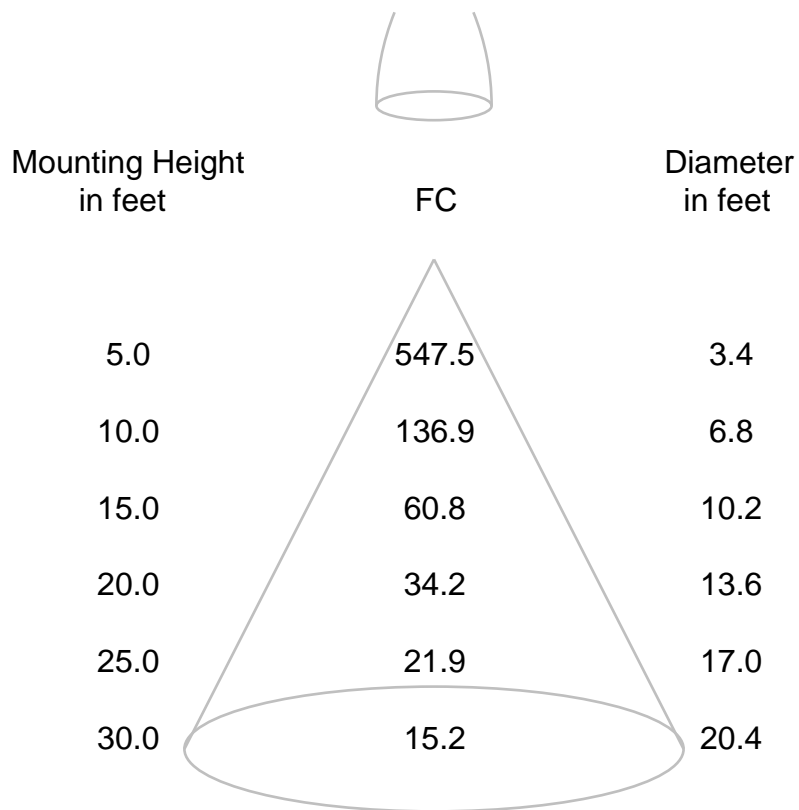
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

REPORT NUMBER: RAB00901
ISSUE DATE: 05/26/15
PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 8
DATE SAMPLE TESTED: 05/26/15

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: RAB00902
DATE: 5/26/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: FALCORA160NW

Page 1 of 4

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: ONE LUMINAIRE CONSISTING OF TWO PAIRS OF HEADS. EACH PAIR MOUNTED IN OPPOSING DIRECTIONS, EACH LIGHT HEAD CONSISTING OF: CAST FINNED METAL HOUSING, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, ONE CIRCUIT BOARD WITH 16 LEDS, CLEAR FLAT PRISMATIC GLASS LENS.

LAMP: SIXTY-FOUR WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDS), TILTED 15-DEGREES FROM VERTICAL BASE-UP POSITION.

DRIVER: RD-144-Q0700-R

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (120.0 AND 277.0 VAC, 60Hz) TO THE TEST SAMPLE.

INSTRUMENTS:	CHROMA PROGRAMMABLE AC POWER SOURCE MODEL 61602	Calibration Due: N/A
	CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202	3/9/16
	OCEAN OPTICS QE65PRO Spectroradiometer	5/15/16
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	5/15/16

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Total Radiant Flux*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRI_a, 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 (277.0 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

REPORT NUMBER: RAB00902
 DATE: 5/26/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: FALCORA160NW

Page 2 of 4

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	13226 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3852
Chromaticity Ordinate y	0.3863
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2244
Chromaticity Ordinate v'	0.5064
Correlated Color Temp CCT (K)	3944
ANSI C78.377-2008 Duv	0.003
Total Radiant Flux (milliWatts)	38634 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.33
Input Power (Watts)	159.5
Input Power Factor (%)	99.9
Input Current THD (%)	3.0
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	82.9
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.592
Input Power (Watts)	156.4
Input Power Factor (%)	95.4
Input Current THD (%)	8.2
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	85
R4 Moderate yellowish green	75
R5 Light bluish green	71
R6 Light blue	71
R7 Light violet	83
R8 Light reddish purple	58
R9 Strong red	-15
R10 Strong yellow	51
R11 Strong green	70
R12 Strong blue	45
R13 Light yellowish pink (skin)	73
R14 Moderate olive green (leaf)	91

*NOTE:

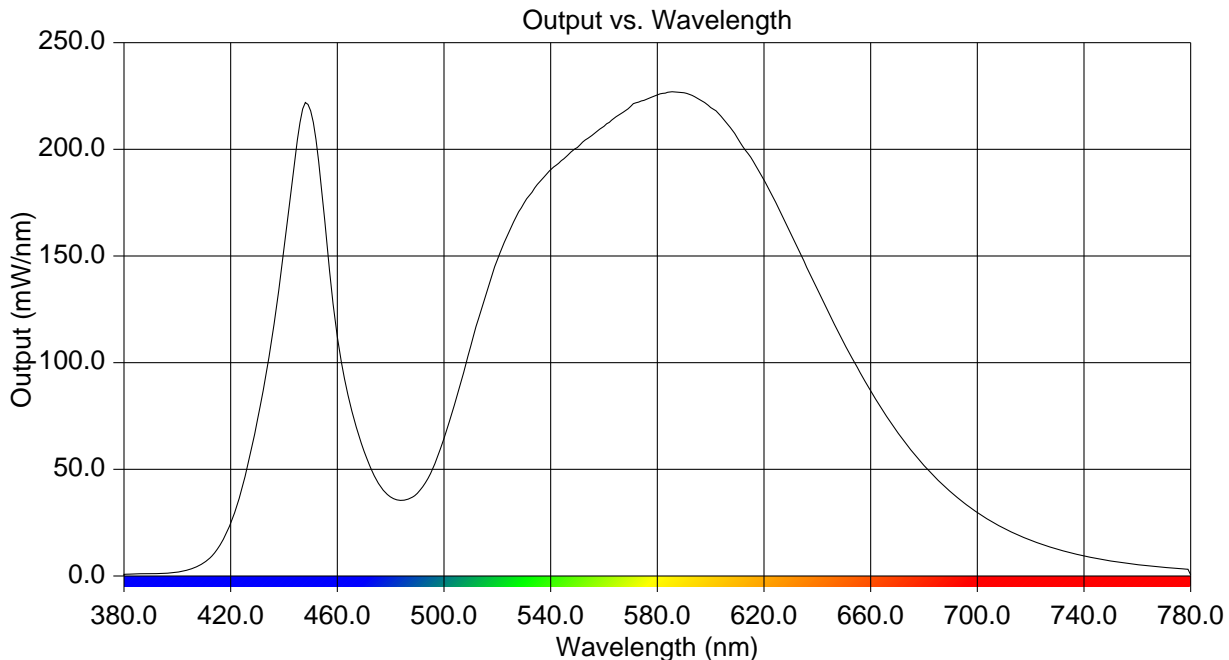
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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.

REPORT NUMBER: RAB00902
 DATE: 5/26/2015
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: FALCORA160NW

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.765	515	128.882	650	109.135
385	0.891	520	148.193	655	97.793
390	1.036	525	162.825	660	86.864
395	1.288	530	174.780	665	76.646
400	1.903	535	183.547	670	67.610
405	3.168	540	190.430	675	59.146
410	6.149	545	195.666	680	51.789
415	12.587	550	200.850	685	45.303
420	24.768	555	205.952	690	39.390
425	44.939	560	210.784	695	34.272
430	72.907	565	215.698	700	29.762
435	108.065	570	220.115	705	25.804
440	153.317	575	222.957	710	22.412
445	204.311	580	225.529	715	19.378
450	218.042	585	227.047	720	16.732
455	169.397	590	226.521	725	14.435
460	112.348	595	223.959	730	12.538
465	79.546	600	219.594	735	10.884
470	58.559	605	214.070	740	9.384
475	44.321	610	205.378	745	8.176
480	36.878	615	196.361	750	7.079
485	35.513	620	185.365	755	6.136
490	38.742	625	173.638	760	5.345
495	48.197	630	160.678	765	4.603
500	64.492	635	147.642	770	4.026
505	84.778	640	134.486	775	3.521
510	107.622	645	121.563	780	0.534



REPORT NUMBER: RAB00902
DATE: 5/26/2015
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: FALCORA160NW

Page 4 of 4

CIE Chromaticity Diagram

