

REPORT NUMBER: RAB00969

ISSUE DATE: 07/29/15

PREPARED FOR: RAB LIGHTING INC.

CATALOG NUMBER: SHARK4-50W/D10 (STANDARD DISTRIBUTION)

LUMINAIRE: FABRICATED WHITE PLASTIC HOUSING, PERFORATED WHITE METAL HEAT SINK, 2 WHITE CIRCUIT BOARDS EACH WITH 64 LEDS, FROSTED POLYCARBONATE LENS ENCLOS

LAMPS: ONE HUNDRED AND TWENTY EIGHT WHITE EMITTING DIODES (LEDs), TILTED 15-DEGREE FROM VERTICAL BASE-UP POSITION.

TOTAL INPUT WATTS = 48.033 AT 277.0 VOLTS

LED DRIVERS: RD-052-A1050-C-089C

\*(SEE PAGE 2 FOR MORE INFORMATION)\*

PAGE: 1 OF 8

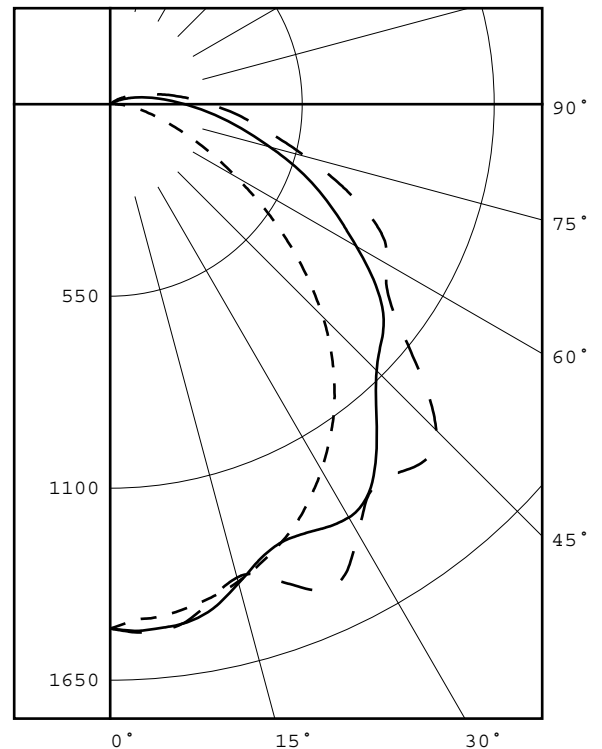
DATE SAMPLE TESTED: 07/29/15

### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0	1502	1502	1502	1502	1502
5	1476	1487	1508	1515	1514
15	1416	1434	1421	1402	1404
25	1297	1296	1352	1487	1522
35	1112	1140	1312	1312	1331
45	862	966	1079	1277	1321
55	561	700	937	990	977
65	300	438	700	804	851
75	136	247	474	572	579
85	48	125	288	354	370
90	16	86	213	270	287
95	14	59	155	204	216
105	11	19	74	105	112
115	8	8	24	45	51
125	6	5	4	10	16
135	4	4	3	3	2
145	4	3	3	3	2
155	4	4	3	3	3
165	4	4	3	3	3
175	5	4	3	3	3
180	4	4	4	4	4

### FLUX

143
402
636
783
846
763
622
439
268
147
70
27
7
3
2
2
1
0



LEGEND:

0-deg: - - - - -  
45-deg: \_\_\_\_\_  
90-deg: - - - - -

### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	1181	22.9
0- 40	1964	38.0
0- 60	3572	69.2
0- 90	4902	95.0
90-120	245	4.7
90-130	252	4.9
90-150	257	5.0
90-180	260	5.0
0-180	5161	100.0

TOTAL INPUT WATTS = 48.0

EFFICACY = 107.5 Lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.2 1.4

Checked X.CAO  
Approved D.WANG-MUNSON

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PAGE: 2 OF 8  
DATE SAMPLE TESTED: 07/29/15

ADDITIONAL INFORMATION

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT  
VOLTAGE TO THE LED DRIVERS.  
TEST PROCEDURE: IESNA LM-79-08  
TEST DISTANCE = 28.25 FEET  
ACCREDITED LABORATORY CODE 201058-0

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PAGE: 3 OF 8  
DATE SAMPLE TESTED: 07/29/15

PLANE : 0-DEG 90-DEG  
BEAM ANGLE (50%) : 96.8 X 137.1 DEGREES  
FIELD ANGLE (10%): 147.5 X 201.2 DEGREES

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PAGE: 4 OF 8  
 DATE SAMPLE TESTED: 07/29/15

### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	1502	1502	1502	1502	1502
5.0	1476	1487	1508	1515	1514
10.0	1452	1469	1490	1480	1475
15.0	1416	1434	1421	1402	1404
20.0	1363	1375	1355	1417	1458
25.0	1297	1296	1352	1487	1522
30.0	1211	1215	1367	1433	1420
35.0	1112	1140	1312	1312	1331
40.0	995	1061	1187	1279	1356
45.0	862	966	1079	1277	1321
50.0	714	842	1020	1157	1137
55.0	561	700	937	990	977
60.0	417	561	814	881	914
65.0	300	438	700	804	851
70.0	205	335	591	699	720
75.0	136	247	474	572	579
80.0	87	178	373	452	461
85.0	48	125	288	354	370
90.0	16	86	213	270	287
95.0	14	59	155	204	216
100.0	13	39	110	149	158
105.0	11	19	74	105	112
110.0	10	9	45	72	77
115.0	8	8	24	45	51
120.0	6	6	6	27	32
125.0	6	5	4	10	16
130.0	4	4	3	3	3
135.0	4	4	3	3	2
140.0	4	4	3	3	2
145.0	4	3	3	3	2
150.0	4	3	3	3	3
155.0	4	4	3	3	3
160.0	4	4	3	3	3
165.0	4	4	3	3	3
170.0	5	4	3	3	3
175.0	5	4	3	3	3
180.0	4	4	4	4	4

REPORT NUMBER: RAB00969  
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PAGE: 5 OF 8  
DATE SAMPLE TESTED: 07/29/15

## ZONAL LUMEN SUMMARY

0- 5	36.
5- 10	107.
10- 15	171.
15- 20	231.
20- 25	291.
25- 30	345.
30- 35	380.
35- 40	403.
40- 45	423.
45- 50	423.
50- 55	399.
55- 60	364.
60- 65	330.
65- 70	292.
70- 75	244.
75- 80	195.
80- 85	152.
85- 90	116.
90- 95	85.
95-100	62.
100-105	43.
105-110	28.
110-115	17.
115-120	10.
120-125	5.
125-130	2.
130-135	1.
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.

REPORT NUMBER: RAB00969  
 ISSUE DATE: 07/29/15  
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PAGE: 6 OF 8  
 DATE SAMPLE TESTED: 07/29/15

### 5-DEGREE ZONAL LUMEN SUMMARY

0- 5	36
5- 10	107
10- 15	171
15- 20	231
20- 25	291
25- 30	345
30- 35	380
35- 40	403
40- 45	423
45- 50	423
50- 55	399
55- 60	364
60- 65	330
65- 70	292
70- 75	244
75- 80	195
80- 85	152
85- 90	116
90- 95	85
95-100	62
100-105	43
105-110	28
110-115	17
115-120	10
120-125	5
125-130	2
130-135	1
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	143
0- 20	545
0- 30	1181
0- 40	1964
0- 50	2809
0- 60	3572
0- 70	4194
0- 80	4633
0- 90	4902
0-100	5049
0-110	5119
0-120	5147
0-130	5154
0-140	5157
0-150	5158
0-160	5160
0-170	5161
0-180	5161

REPORT NUMBER: RAB00969  
ISSUE DATE: 07/29/15

PAGE: 7 OF 8  
DATE SAMPLE TESTED: 07/29/15

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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	118	118	118	118	115	115	115	115	108	108	108	103	103	103	97	97	97	95
1	106	100	95	91	103	98	93	89	92	89	85	88	85	82	83	81	78	76
2	96	87	79	73	92	84	77	72	80	74	69	76	71	67	72	68	65	62
3	87	76	67	60	84	74	66	59	70	63	57	66	61	56	63	58	54	52
4	79	67	57	50	77	65	56	50	62	54	48	59	52	47	56	51	46	44
5	73	59	50	43	70	58	49	43	55	47	42	53	46	41	50	44	40	37
6	67	53	44	37	65	52	43	37	50	42	36	47	41	36	45	39	35	33
7	62	48	39	33	60	47	39	33	45	37	32	43	36	31	41	35	31	29
8	58	44	35	29	56	43	35	29	41	34	28	40	33	28	38	32	27	25
9	54	40	32	26	52	39	31	26	38	31	25	36	30	25	35	29	25	23
10	50	37	29	24	49	36	29	23	35	28	23	34	27	23	32	27	22	21

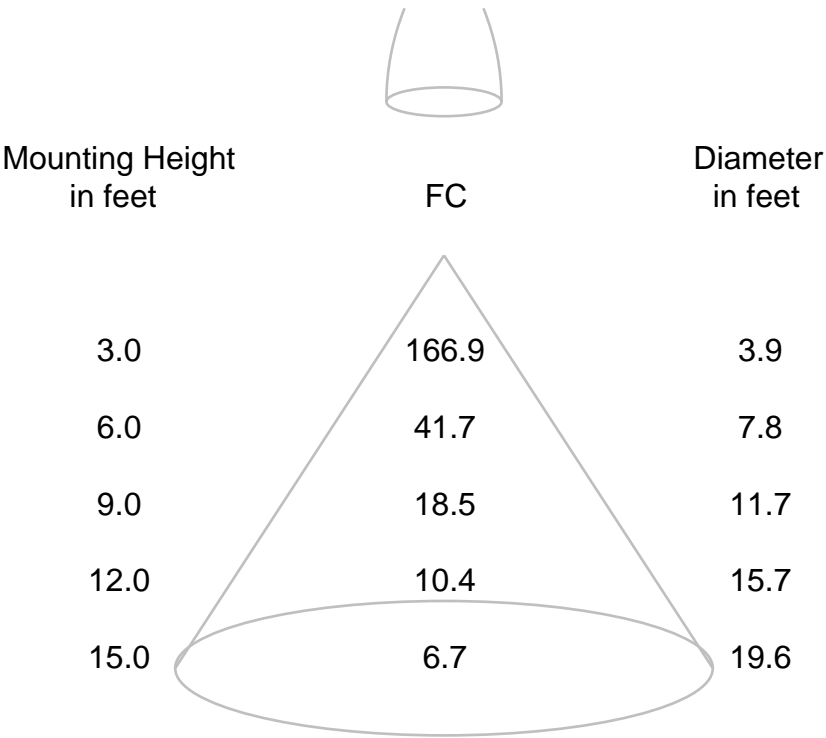
ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

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PAGE: 8 OF 8  
DATE SAMPLE TESTED: 07/29/15

# 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.



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CATALOG NUMBER: SHARK4-50W/D10 (STANDARD DISTRIBUTION)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: FABRICATED WHITE PLASTIC HOUSING, PERFORATED WHITE METAL HEAT SINK, 2 WHITE CIRCUIT BOARDS EACH WITH 64 LEDS, FROSTED POLYCARBONATE LENS ENCLOSURE.

LAMP: ONE HUNDRED AND TWENTY EIGHT WHITE EMITTING DIODES (LEDs), TILTED 15-DEGREE FROM VERTICAL BASE-UP POSITION.

DRIVER: RD-052-A1050-C-089C

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	7/24/16
	RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	7/24/16

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 (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 X.CAO

Approved D.WANG-MUNSON  
Lighting Engineer

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Page 2 of 4

### RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	5161 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3410
Chromaticity Ordinate y	0.3490
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2096
Chromaticity Ordinate v'	0.4828
Correlated Color Temp CCT (K)	5153
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	15862 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.402
Input Power (Watts)	47.8
Input Power Factor (%)	99.1
Input Current THD (%)	7.5
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
	108.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.182
Input Power (Watts)	48.0
Input Power Factor (%)	95.2
Input Current THD (%)	8.9
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	75
R1 Light greyish red	74
R2 Dark greyish yellow	79
R3 Strong yellowish green	82
R4 Moderate yellowish green	77
R5 Light bluish green	75
R6 Light blue	71
R7 Light violet	82
R8 Light reddish purple	63
R9 Strong red	-12
R10 Strong yellow	49
R11 Strong green	75
R12 Strong blue	49
R13 Light yellowish pink (skin)	74
R14 Moderate olive green (leaf)	89

### \*NOTE:

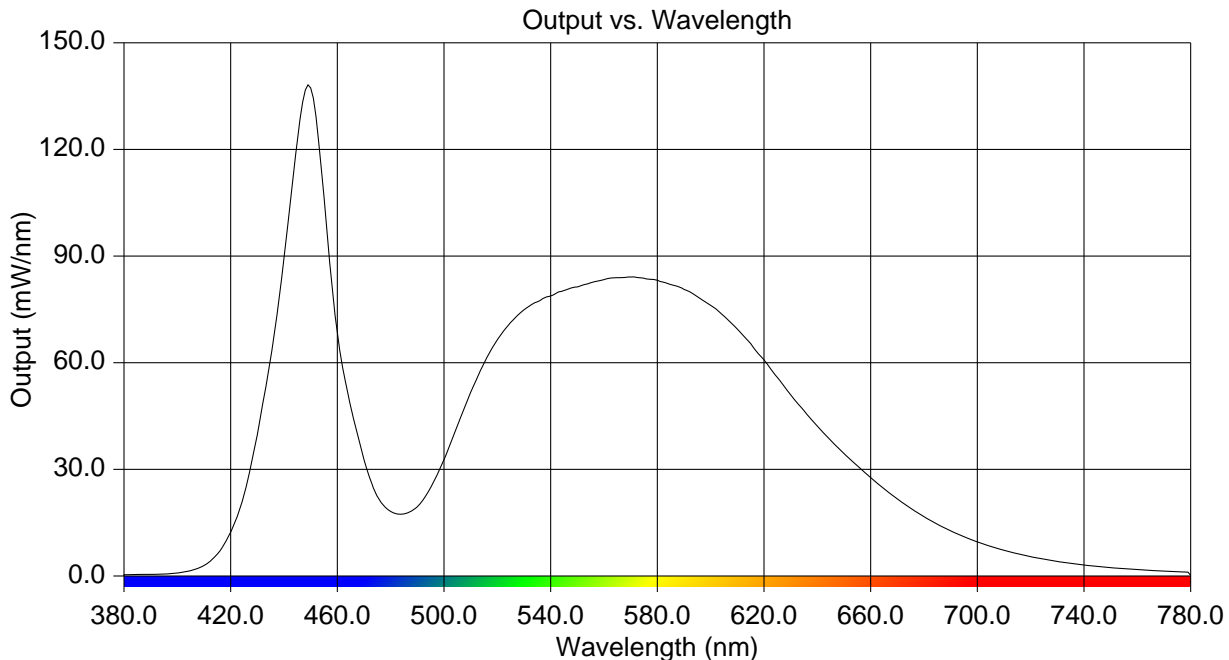
Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even 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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Page 3 of 4

### RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.336	515	59.876	650	34.431
385	0.385	520	66.424	655	31.013
390	0.444	525	71.256	660	27.657
395	0.565	530	74.878	665	24.532
400	0.846	535	77.110	670	21.655
405	1.476	540	78.729	675	19.009
410	2.954	545	80.240	680	16.678
415	6.158	550	81.289	685	14.541
420	12.240	555	82.476	690	12.698
425	22.824	560	83.350	695	11.053
430	39.731	565	83.981	700	9.578
435	61.615	570	84.091	705	8.297
440	88.718	575	83.749	710	7.186
445	122.806	580	83.173	715	6.259
450	137.283	585	81.952	720	5.457
455	106.697	590	80.612	725	4.728
460	68.294	595	78.573	730	4.108
465	47.656	600	76.120	735	3.557
470	32.729	605	73.082	740	3.087
475	22.473	610	69.441	745	2.694
480	18.146	615	65.371	750	2.351
485	17.475	620	60.803	755	2.041
490	19.476	625	55.858	760	1.777
495	24.774	630	50.955	765	1.567
500	32.751	635	46.504	770	1.363
505	42.066	640	42.104	775	1.198
510	51.672	645	38.158	780	0.183



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Page 4 of 4

## CIE Chromaticity Diagram

