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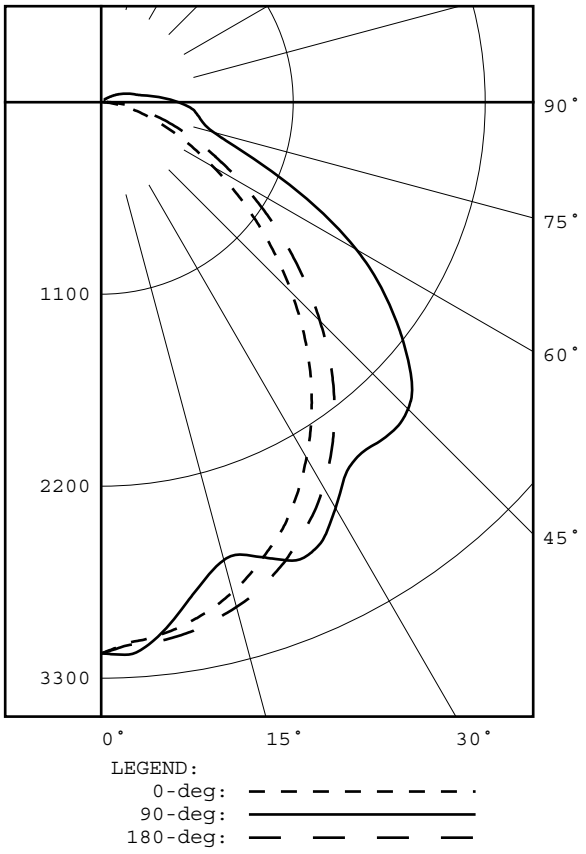
ISSUE DATE: 12/15/16
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: SHARK8-70YNW/D10
LUMINAIRE: FABRICATED WHITE PLASTIC HOUSING, PERFORATED WHITE METAL HEAT SINK, 4 WHITE CIRCUIT BOARDS EACH WITH 64 LEDS, FROSTED POLYCARBONATE LENS ENCLOSURE.
LAMPS: TWO HUNDRED AND FIFTY SIX WHITE EMITTING DIODES (LEDS), TILTED 15-DEGREE FROM VERTICAL BASE-UP POSITION.
TOTAL INPUT WATTS = 73.8 AT 277.0 VOLTS
LED DRIVERS: 2 X RD-042-A0700-C
(SEE PAGE 2 FOR MORE INFORMATION)

CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	FLUX
0	3158	3158	3158	3158	3158	
5	3085	3128	3120	3154	3112	293
15	2906	2759	2717	2809	2995	797
25	2577	2582	2847	2648	2730	1231
35	2104	2485	2516	2599	2321	1513
45	1543	2071	2486	2198	1773	1656
55	989	1833	2015	2003	1197	1558
65	539	1218	1287	1393	705	1129
75	234	622	668	719	350	637
85	53	355	533	416	120	387
90	3	284	441	335	46	
95	3	221	334	262	32	228
105	3	100	185	125	21	109
115	3	39	106	52	13	51
125	3	11	40	16	9	17
135	4	7	11	9	6	6
145	6	6	7	6	6	4
155	6	4	6	4	6	2
165	6	4	4	3	6	1
175	6	4	4	4	6	0
180	4	4	4	4	4	



ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	2321	24.1
0- 40	3834	39.9
0- 60	7048	73.3
0- 90	9202	95.6
90-120	388	4.0
90-130	406	4.2
90-150	416	4.3
90-180	420	4.4
0-180	9622	100.0

TOTAL INPUT WATTS = 73.8
EFFICACY = 130.4 Lm/W
CIE TYPE - DIRECT

PLANE	0-DEG	90-DEG	180-DEG
SPACING CRITERIA	1.1	1.3	1.2

Checked	X.CAO
Approved	D.WANG-MUNSON

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PREPARED FOR: RAB LIGHTING INC.

ADDITIONAL INFORMATION

THIS REPORT WAS PRORATED FROM RAB TEST NUMBER 2635 WHICH WAS A 4’(128 LED) LUMINAIRE. THE DATA WAS DOUBLED TO REPRESENT AN 8’ LUMINAIRE WITH 256 LEDS AND USING TWO OF THE SAME DRIVERS AS WAS USED FOR THE 4’ TEST. ACTUAL PERFORMANCE MAY VARY.
TEST PROCEDURE: IESNA LM-79-08
TEST DISTANCE = 28.25 FEET

REPORT NUMBER: PRORATED FROM RAB02635 PAGE: 3 OF 9
ISSUE DATE: 12/15/16
PREPARED FOR: RAB LIGHTING INC.

PLANE	: 0-DEG	90-DEG
BEAM ANGLE (50%)	: 92.3 X	122.5 DEGREES
FIELD ANGLE (10%)	: 147.9 X	191.5 DEGREES

REPORT NUMBER: PRORATED FROM RAB02635 PAGE: 4 OF 9
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PLANE	: 0-DEG	90-DEG
LUMINOUS LENGTH	:96.060	5.150
HEIGHT OF SIDE	: 1.860	1.860

LUMINANCE DATA IN CANDELA/SQ METER

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 90-DEG	AVERAGE 180-DEG
45	6706.	8090.	7702.
55	5254.	7258.	6358.
65	3834.	5374.	5017.
75	2636.	3442.	3946.
85	1560.	3736.	3542.

REPORT NUMBER: PRORATED FROM RAB02635 PAGE: 5 OF 9
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CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
0.0	3158	3158	3158	3158	3158	3158	3158	3158	3158
5.0	3085	3100	3128	3130	3120	3143	3154	3130	3112
10.0	3015	3006	2966	2915	2895	2935	3006	3064	3072
15.0	2906	2857	2759	2716	2717	2734	2809	2935	2995
20.0	2754	2667	2612	2703	2779	2733	2664	2764	2883
25.0	2577	2476	2582	2784	2847	2826	2648	2584	2730
30.0	2353	2306	2598	2684	2685	2733	2687	2425	2545
35.0	2104	2162	2485	2466	2516	2524	2599	2297	2321
40.0	1831	2039	2261	2393	2518	2449	2387	2194	2062
45.0	1543	1887	2071	2377	2486	2450	2198	2075	1773
50.0	1258	1672	1975	2240	2296	2321	2122	1884	1479
55.0	989	1410	1833	1970	2015	2056	2003	1628	1197
60.0	744	1142	1565	1641	1688	1737	1744	1356	936
65.0	539	883	1218	1260	1287	1353	1393	1096	705
70.0	368	643	884	901	909	977	1025	833	512
75.0	234	438	622	651	668	698	719	589	350
80.0	132	288	453	539	580	572	530	396	221
85.0	53	186	355	476	533	507	416	265	120
90.0	3	122	284	398	441	428	335	179	46
95.0	3	80	221	302	334	328	262	123	32
100.0	3	44	149	209	234	228	182	77	27
105.0	3	16	100	156	185	171	125	40	21
110.0	3	9	67	120	143	132	85	19	17
115.0	3	7	39	85	106	93	52	16	13
120.0	3	6	16	53	70	59	23	13	10
125.0	3	6	11	27	40	30	16	10	9
130.0	4	6	9	14	17	14	11	9	7
135.0	4	4	7	10	11	10	9	7	6
140.0	4	6	6	9	9	9	7	6	6
145.0	6	6	6	7	7	7	6	6	6
150.0	4	6	4	6	6	6	4	4	4
155.0	6	6	4	4	6	4	4	4	6
160.0	6	6	4	4	4	4	4	4	6
165.0	6	6	4	3	4	3	3	4	6
170.0	6	6	4	3	3	3	4	4	6
175.0	6	6	4	3	4	3	4	6	6
180.0	4	4	4	4	4	4	4	4	4

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PREPARED FOR: RAB LIGHTING INC.

ZONAL LUMEN SUMMARY

0- 5	75.
5- 10	218.
10- 15	343.
15- 20	454.
20- 25	566.
25- 30	665.
30- 35	733.
35- 40	780.
40- 45	819.
45- 50	837.
50- 55	813.
55- 60	744.
60- 65	633.
65- 70	496.
70- 75	365.
75- 80	272.
80- 85	215.
85- 90	172.
90- 95	133.
95-100	95.
100-105	64.
105-110	45.
110-115	31.
115-120	20.
120-125	11.
125-130	6.
130-135	4.
135-140	3.
140-145	2.
145-150	2.
150-155	1.
155-160	1.
160-165	1.
165-170	0.
170-175	0.
175-180	0.

REPORT NUMBER: PRORATED FROM RAB02635 PAGE: 7 OF 9
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PREPARED FOR: RAB LIGHTING INC.

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	75
5- 10	218
10- 15	343
15- 20	454
20- 25	566
25- 30	665
30- 35	733
35- 40	780
40- 45	819
45- 50	837
50- 55	813
55- 60	744
60- 65	633
65- 70	496
70- 75	365
75- 80	272
80- 85	215
85- 90	172
90- 95	133
95-100	95
100-105	64
105-110	45
110-115	31
115-120	20
120-125	11
125-130	6
130-135	4
135-140	3
140-145	2
145-150	2
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	293
0- 20	1090
0- 30	2321
0- 40	3834
0- 50	5491
0- 60	7048
0- 70	8177
0- 80	8815
0- 90	9202
0-100	9430
0-110	9539
0-120	9590
0-130	9608
0-140	9614
0-150	9618
0-160	9620
0-170	9621
0-180	9622

REPORT NUMBER: PRORATED FROM RAB02635 PAGE: 8 OF 9
ISSUE DATE: 12/15/16

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	118	118	118	118	115	115	115	115	109	109	109	103	103	103	98	98	98	96
1	107	102	97	93	104	99	95	91	94	90	87	89	86	84	85	83	81	78
2	97	88	81	75	94	86	79	74	82	76	71	78	73	69	74	70	67	65
3	88	77	69	62	85	75	67	61	72	65	60	68	63	58	65	60	56	54
4	81	68	59	52	78	67	58	52	63	56	50	61	54	49	58	53	48	46
5	74	61	52	45	71	59	51	44	57	49	43	54	48	43	52	46	42	39
6	68	55	45	39	66	53	45	39	51	43	38	49	42	37	47	41	36	34
7	63	49	40	34	61	48	40	34	46	39	33	45	38	33	43	37	32	30
8	59	45	36	30	57	44	36	30	42	35	30	41	34	29	39	33	29	27
9	55	41	33	27	53	40	32	27	39	32	27	38	31	26	36	30	26	24
10	51	38	30	25	50	37	30	24	36	29	24	35	28	24	34	28	23	22

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: PRORATED FROM RAB02635
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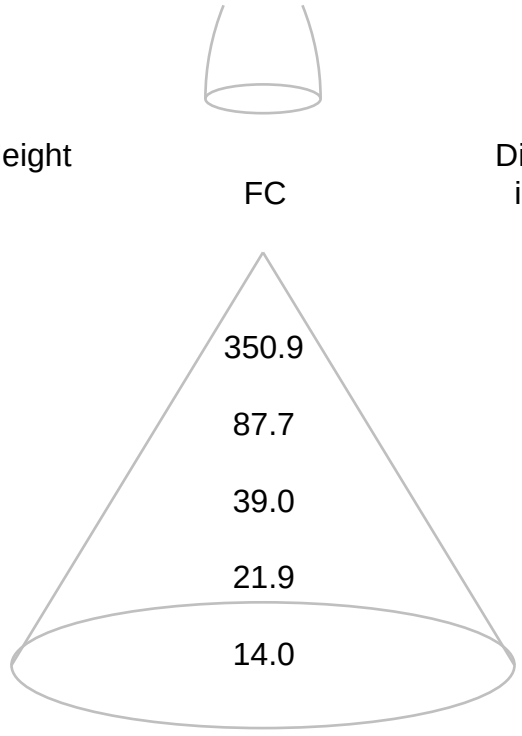
CONE OF LIGHT DIAGRAM

(diameter shown is where fc value is half the fc at nadir)



Mounting Height in feet	FC	Diameter in feet
3.0	350.9	3.6
6.0	87.7	7.3
9.0	39.0	10.9
12.0	21.9	14.6
15.0	14.0	18.2

Note: The candela values used to generate this diagram were obtained by averaging the photometric data into a single plane.

NVLAP LAB CODE: 201058-0

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REPORT NUMBER: RAB02817
DATE: 12/14/2016
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: SHARK8-70YNW/D10

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: FABRICATED WHITE PLASTIC HOUSING, PERFORATED WHITE METAL HEAT SINK, 4 WHITE CIRCUIT BOARDS EACH WITH 64 LEDS, FROSTED POLYCARBONATE LENS ENCLOSURE.

LAMP: TWO HUNDRED AND FIFTY SIX WHITE EMITTING DIODES (LEDS), TILTED 15-DEGREE FROM VERTICAL BASE-UP POSITION.

DRIVER: 2 X RD-042-A0700-C

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (277.0 AND 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	12/05/17
RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	12/05/17

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 (120.0 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

REPORT NUMBER: RAB02817
DATE: 12/14/2016
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: SHARK8-70YNW/D10

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	9622 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4061
Chromaticity Ordinate y	0.3902
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2364
Chromaticity Ordinate v'	0.5112
Correlated Color Temp CCT (K)	3478
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	27649 *
ELECTRICAL	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.278
Input Power (Watts)	73.8
Input Power Factor (%)	95.9
Input Current THD (%)	8.9
Input Voltage THD (%)	0.1
EFFICACY (Lumens/Watt)	130.4
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.616
Input Power (Watts)	73.4
Input Power Factor (%)	99.2
Input Current THD (%)	7.5
Input Voltage THD (%)	0.1
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	75
R1 Light greyish red	72
R2 Dark greyish yellow	84
R3 Strong yellowish green	94
R4 Moderate yellowish green	72
R5 Light bluish green	72
R6 Light blue	78
R7 Light violet	80
R8 Light reddish purple	50
R9 Strong red	-25
R10 Strong yellow	63
R11 Strong green	69
R12 Strong blue	53
R13 Light yellowish pink (skin)	74
R14 Moderate olive green (leaf)	97

*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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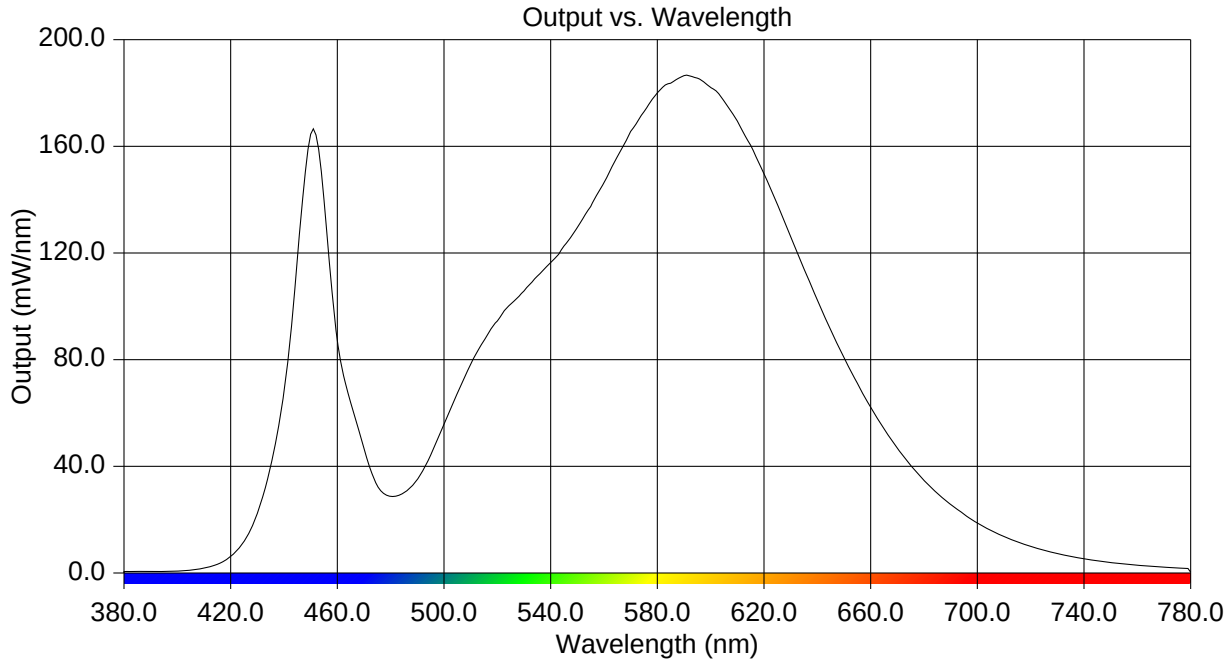
CATALOG NUMBER: SHARK8-70YNW/D10

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.515	515	87.282	650	80.689
385	0.549	520	94.492	655	71.187
390	0.571	525	100.794	660	62.184
395	0.596	530	105.759	665	54.000
400	0.754	535	111.327	670	46.798
405	1.045	540	116.347	675	40.389
410	1.789	545	122.638	680	34.764
415	3.258	550	129.609	685	29.877
420	6.272	555	137.402	690	25.622
425	11.812	560	146.505	695	22.049
430	22.397	565	156.129	700	18.735
435	40.316	570	165.598	705	15.955
440	67.927	575	172.977	710	13.662
445	117.094	580	179.943	715	11.691
450	164.551	585	183.672	720	10.002
455	139.936	590	186.510	725	8.538
460	87.201	595	185.578	730	7.293
465	63.899	600	182.110	735	6.201
470	46.526	605	177.005	740	5.304
475	32.859	610	169.486	745	4.558
480	28.802	615	160.396	750	3.936
485	30.114	620	149.585	755	3.389
490	35.103	625	138.179	760	2.928
495	44.202	630	126.052	765	2.517
500	55.830	635	114.036	770	2.173
505	67.508	640	102.223	775	1.885
510	78.267	645	91.255	780	0.285



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CIE Chromaticity Diagram