

REPORT NUMBER: RAB01273  
 ISSUE DATE: 10/12/15  
 PREPARED FOR: RAB LIGHTING INC.  
 CATALOG NUMBER: PANEL2X4-59YN (Standard Distribution)  
 LUMINAIRE: LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 4 WHITE  
 CIRCUIT BOARDS EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC  
 LENS. LENS FROSTED SIDE UP.  
 LAMPS: FOUR HUNDRED EIGHTY WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL  
 BASE-UP POSITION.  
 NOTE: DATA SHOWN IS ABSOLUTE FOR THE  
 SAMPLE PROVIDED.  
 TOTAL INPUT WATTS = 58.427 W AT 277.0 VAC.  
 LED DRIVER: 2 X RD-036-A0700-R-062C  
 TEST PROCEDURE: IESNA LM-79-08  
 ACCREDITED LABORATORY CODE 201058-0

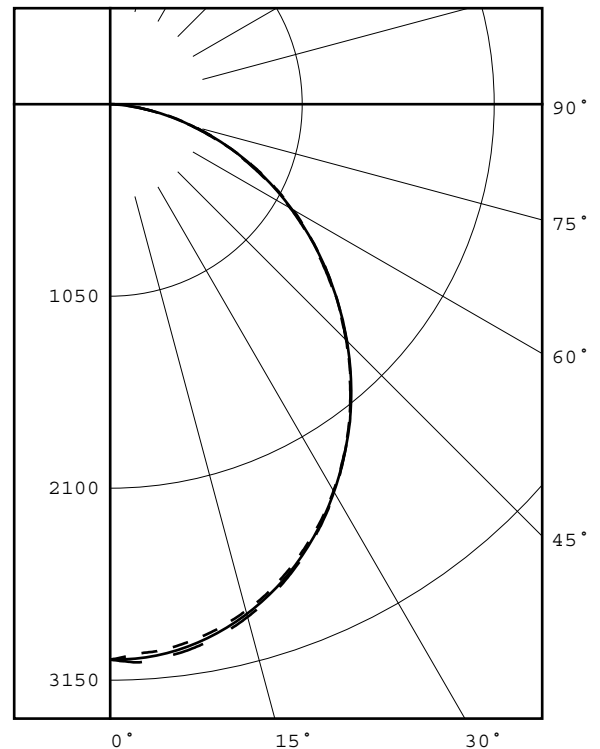
PAGE: 1 OF 5  
 DATE SAMPLE TESTED: 10/12/15

CANDELA DISTRIBUTION						FLUX
0.0	22.5	45.0	67.5	90.0		
0	3038	3038	3038	3038	3038	
5	3001	3009	3024	3038	3043	287
15	2868	2875	2886	2899	2903	814
25	2609	2613	2621	2627	2627	1206
35	2253	2253	2257	2257	2255	1410
45	1827	1829	1830	1830	1825	1411
55	1378	1383	1375	1375	1366	1231
65	925	925	916	916	908	909
75	475	476	469	469	464	500
85	97	97	93	96	91	121
90	4	5	5	5	4	



ZONE	LUMEN	SUMMARY
ZONE	LUMENS	%FIXT
0- 30	2307	29.2
0- 40	3716	47.1
0- 60	6358	80.6
0- 90	7889	100.0
90-180	0	0.0
0-180	7889	100.0

TOTAL INPUT WATTS = 58.4  
 EFFICACY = 135.1 Lm/W  
 CIE TYPE - DIRECT  
 PLANE : 0-DEG 90-DEG  
 SPACING CRITERIA : 1.2 1.2



LEGEND:  
 0-deg: - - - - -  
 45-deg: = = = = =  
 90-deg: - - - - -

Checked X.CAO  
 Approved D.WANG-MUNSON

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PAGE: 2 OF 5  
 DATE SAMPLE TESTED: 10/12/15

CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0.0	3038	3038	3038	3038	3038
2.5	3012	3021	3036	3050	3055
5.0	3001	3009	3024	3038	3043
7.5	2980	2988	3003	3017	3022
10.0	2951	2959	2972	2987	2992
12.5	2914	2922	2934	2948	2952
15.0	2868	2875	2886	2899	2903
17.5	2816	2821	2831	2843	2846
20.0	2753	2759	2769	2778	2780
22.5	2685	2689	2698	2706	2707
25.0	2609	2613	2621	2627	2627
27.5	2531	2530	2538	2542	2543
30.0	2442	2442	2448	2451	2452
32.5	2350	2349	2353	2356	2355
35.0	2253	2253	2257	2257	2255
37.5	2151	2151	2157	2153	2151
40.0	2046	2045	2051	2045	2043
42.5	1938	1940	1941	1943	1932
45.0	1827	1829	1830	1830	1825
47.5	1715	1723	1718	1719	1710
50.0	1603	1607	1604	1604	1595
52.5	1491	1497	1490	1490	1480
55.0	1378	1383	1375	1375	1366
57.5	1264	1269	1260	1260	1253
60.0	1155	1156	1145	1145	1139
62.5	1040	1041	1031	1031	1023
65.0	925	925	916	916	908
67.5	810	810	805	802	794
70.0	691	696	690	689	681
72.5	585	585	579	578	571
75.0	475	476	469	469	464
77.5	373	372	366	366	362
80.0	271	271	267	267	261
82.5	177	177	175	175	169
85.0	97	97	93	96	91
87.5	37	38	37	38	35
90.0	4	5	5	5	4

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PAGE: 3 OF 5  
DATE SAMPLE TESTED: 10/12/15

ZONAL LUMEN SUMMARY

0- 5	72.
5- 10	214.
10- 15	348.
15- 20	466.
20- 25	565.
25- 30	641.
30- 35	692.
35- 40	718.
40- 45	717.
45- 50	693.
50- 55	648.
55- 60	583.
60- 65	502.
65- 70	407.
70- 75	303.
75- 80	197.
80- 85	97.
85- 90	24.

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PAGE: 4 OF 5  
DATE SAMPLE TESTED: 10/12/15

5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	72
5- 10	214
10- 15	348
15- 20	466
20- 25	565
25- 30	641
30- 35	692
35- 40	718
40- 45	717
45- 50	693
50- 55	648
55- 60	583
60- 65	502
65- 70	407
70- 75	303
75- 80	197
80- 85	97
85- 90	24
90- 95	1
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	0
145-150	0
150-155	0
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	287
0- 20	1101
0- 30	2307
0- 40	3716
0- 50	5127
0- 60	6358
0- 70	7267
0- 80	7768
0- 90	7888
0-100	7889
0-110	7889
0-120	7889
0-130	7889
0-140	7889
0-150	7889
0-160	7889
0-170	7889
0-180	7889

REPORT NUMBER: RAB01273  
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PAGE: 5 OF 5  
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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	104	100	97	106	102	98	95	98	95	92	94	91	89	90	88	86	84
2	99	91	85	79	97	89	83	78	86	81	76	83	78	75	80	76	73	71
3	91	80	72	66	88	79	71	65	76	70	64	73	68	63	71	66	62	60
4	83	71	63	56	81	70	62	56	68	61	55	65	59	54	63	58	54	51
5	77	64	55	49	75	63	55	48	61	53	48	59	52	47	57	51	47	45
6	71	58	49	43	69	57	48	42	55	48	42	53	47	42	52	46	41	39
7	66	52	44	38	64	52	43	38	50	43	37	49	42	37	47	41	37	35
8	61	48	39	34	60	47	39	34	46	39	33	45	38	33	43	37	33	31
9	57	44	36	30	56	43	36	30	42	35	30	41	35	30	40	34	30	28
10	54	41	33	28	52	40	33	28	39	32	27	38	32	27	37	31	27	25

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: RAB01274  
DATE: 10/9/2015  
PREPARED FOR: RAB LIGHTING INC.  
CATALOG NUMBER: PANEL2X4-59YN (Standard Distribution)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 4 WHITE CIRCUIT BOARDS EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC LENS. LENS FROSTED SIDE UP.

LAMP: FOUR HUNDRED EIGHTY WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.

DRIVER: 2 X RD-036-A0700-R-062C

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 10/07/16  
RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry 10/07/16

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

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RESULTS:

<b>PHOTOMETRIC</b>	
Total Integrated Flux (lumens)	7889 *
<b>SPECTRORADIOMETRIC</b>	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4092
Chromaticity Ordinate y	0.3928
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2374
Chromaticity Ordinate v'	0.5127
Correlated Color Temp CCT (K)	3433
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	24095 *
<b>ELECTRICAL</b>	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.478
Input Power (Watts)	57.1
Input Power Factor (%)	99.5
Input Current THD (%)	6.6
Input Voltage THD (%)	0.2
<b>EFFICACY (Lumens/Watt)</b>	
138.2	
<b>ELECTRICAL AT MAX NONIMAL INPUT</b>	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.233
Input Power (Watts)	58.4
Input Power Factor (%)	90.5
Input Current THD (%)	10.5
Input Voltage THD (%)	0.2
<b>Off-State Power (Watts)</b>	
0.0	

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	81
R2 Dark greyish yellow	89
R3 Strong yellowish green	94
R4 Moderate yellowish green	82
R5 Light bluish green	81
R6 Light blue	85
R7 Light violet	86
R8 Light reddish purple	65
R9 Strong red	14
R10 Strong yellow	73
R11 Strong green	81
R12 Strong blue	62
R13 Light yellowish pink (skin)	83
R14 Moderate olive green (leaf)	97

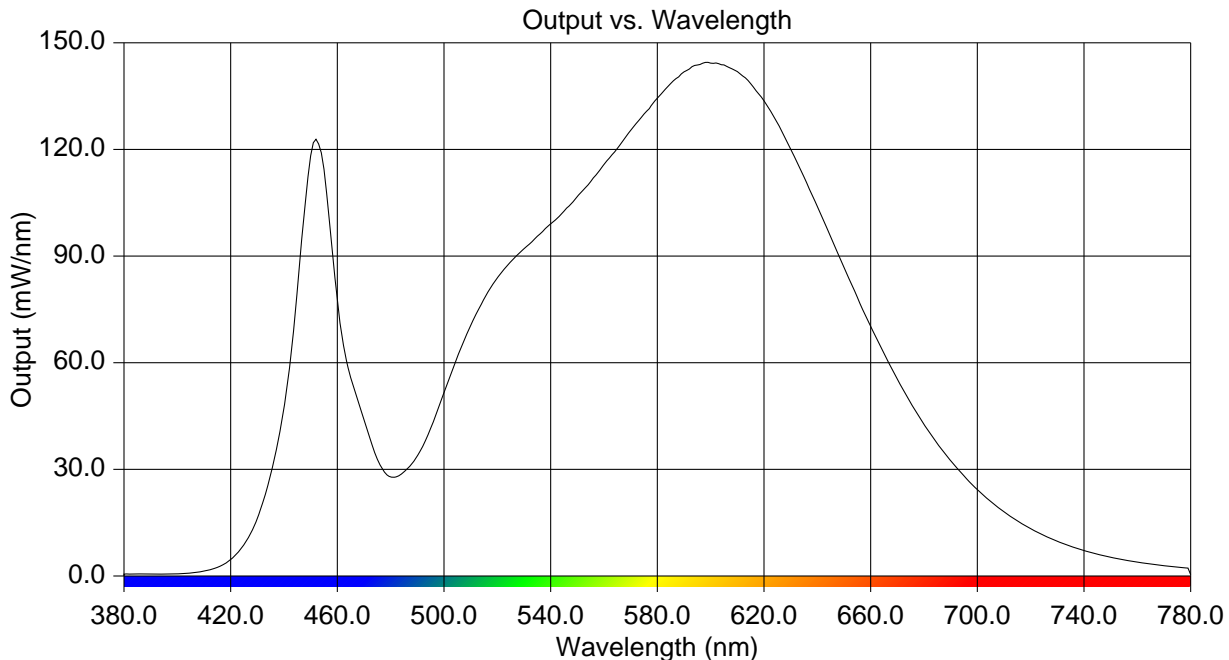
\*NOTE:

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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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.532	515	77.825	650	86.747
385	0.578	520	83.804	655	78.404
390	0.539	525	88.457	660	70.295
395	0.543	530	92.074	665	62.553
400	0.625	535	95.557	670	55.445
405	0.824	540	99.053	675	48.652
410	1.330	545	102.603	680	42.652
415	2.423	550	106.759	685	37.241
420	4.606	555	110.919	690	32.419
425	8.832	560	115.843	695	28.168
430	16.215	565	120.157	700	24.315
435	28.478	570	125.322	705	20.959
440	47.340	575	129.920	710	18.055
445	80.369	580	134.414	715	15.508
450	118.203	585	138.499	720	13.297
455	114.391	590	141.789	725	11.405
460	77.561	595	143.710	730	9.719
465	55.807	600	144.240	735	8.341
470	43.891	605	143.741	740	7.150
475	32.842	610	141.872	745	6.159
480	27.853	615	138.474	750	5.297
485	29.345	620	133.636	755	4.523
490	33.778	625	127.449	760	3.906
495	41.553	630	120.177	765	3.359
500	51.544	635	112.231	770	2.904
505	61.499	640	104.053	775	2.501
510	70.471	645	95.326	780	0.377





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Page 4 of 4

## CIE Chromaticity Diagram

