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TESTING
NVLAP LAB CODE: 201058-0

REPORT NUMBER: RAB04632 **PAGE:** 1 OF 6
ISSUE DATE: 09/13/18 **DATE SAMPLE TESTED:** 09/13/18
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
CATALOG NUMBER: CDL2[WD, S, PC, PS]-10W40D935-ODLENS
LUMINAIRE: EXTRUDED BLACK PAINTED ALUMINUM HOUSING, 1 WHITE CIRCUIT BOARD WITH ONE LED, POLYCARBONATE TIR LENS ON TOP OF THE LED, ALUMINUM TRIM DOOR WITH GLASS LENS.
LAMP: ONE WHITE LIGHT EMITTING DIODES (LEDS).
NOTE: THIS REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.
ABSOLUTE: NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
WATT: TOTAL INPUT WATTS = 11.8 W AT 277.0 VAC.
LED DRIVER: LED DRIVER: RDP-010-3EV40-A026
PROCEDURE: TEST PROCEDURE: IESNA LM-79-08
NOTE: LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE
AMBIENT: 25.6
NVLAP LAB CODE: ACCREDITED LABORATORY CODE 201058-0

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Checked *X.CAO*

Approved *D.WANG-MUNSON*

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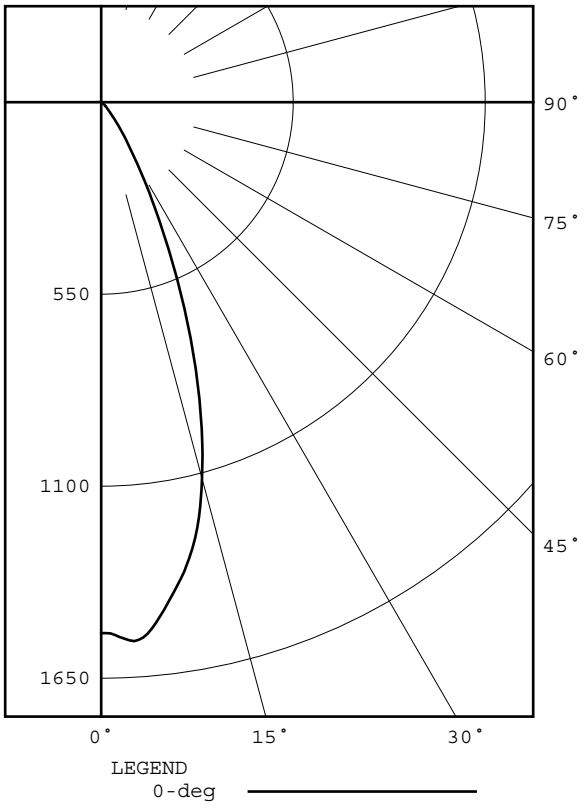
DEG	CANDELA	LUMENS
0	1521	
5	1528	140
15	1116	303
25	441	205
35	105	68
45	23	18
55	5	5
65	0	1
75	0	0
85	0	0
90	0	
95	0	0
105	0	0
115	0	0
125	0	0
135	0	0
145	0	0
155	0	0
165	0	0
175	0	0
180	0	

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	648	87.6
0- 40	716	96.7
0- 60	739	99.9
0- 90	740	100.0
90-120	0	0.0
90-130	0	0.0
90-150	0	0.0
90-180	0	0.0
0-180	740	100.0

EFFICACY = 62.7 lm/W
CIE TYPE - DIRECT
SPACING CRITERION: 0.63



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CANDELA DISTRIBUTION

0.0	1521	60.0	1	120.0	0	180.0	0
1.0	1522	61.0	1	121.0	0		
2.0	1533	62.0	1	122.0	0		
3.0	1544	63.0	1	123.0	0		
4.0	1544	64.0	1	124.0	0		
5.0	1528	65.0	0	125.0	0		
6.0	1500	66.0	0	126.0	0		
7.0	1467	67.0	1	127.0	0		
8.0	1433	68.0	1	128.0	0		
9.0	1400	69.0	1	129.0	0		
10.0	1366	70.0	0	130.0	0		
11.0	1327	71.0	1	131.0	0		
12.0	1285	72.0	0	132.0	0		
13.0	1235	73.0	0	133.0	0		
14.0	1177	74.0	0	134.0	0		
15.0	1116	75.0	0	135.0	0		
16.0	1052	76.0	0	136.0	0		
17.0	986	77.0	0	137.0	0		
18.0	917	78.0	0	138.0	0		
19.0	848	79.0	0	139.0	0		
20.0	776	80.0	0	140.0	0		
21.0	704	81.0	0	141.0	0		
22.0	635	82.0	0	142.0	0		
23.0	566	83.0	0	143.0	0		
24.0	499	84.0	0	144.0	0		
25.0	441	85.0	0	145.0	0		
26.0	387	86.0	0	146.0	0		
27.0	337	87.0	0	147.0	0		
28.0	294	88.0	0	148.0	0		
29.0	254	89.0	0	149.0	0		
30.0	217	90.0	0	150.0	0		
31.0	185	91.0	0	151.0	0		
32.0	159	92.0	0	152.0	0		
33.0	138	93.0	0	153.0	0		
34.0	121	94.0	0	154.0	0		
35.0	105	95.0	0	155.0	0		
36.0	89	96.0	0	156.0	0		
37.0	74	97.0	0	157.0	0		
38.0	61	98.0	0	158.0	0		
39.0	50	99.0	0	159.0	0		
40.0	42	100.0	0	160.0	0		
41.0	37	101.0	0	161.0	0		
42.0	32	102.0	0	162.0	0		
43.0	28	103.0	0	163.0	0		
44.0	25	104.0	0	164.0	0		
45.0	23	105.0	0	165.0	0		
46.0	20	106.0	0	166.0	0		
47.0	18	107.0	0	167.0	0		
48.0	16	108.0	0	168.0	0		
49.0	14	109.0	0	169.0	0		
50.0	12	110.0	0	170.0	0		
51.0	11	111.0	0	171.0	0		
52.0	10	112.0	0	172.0	0		
53.0	8	113.0	0	173.0	0		
54.0	7	114.0	0	174.0	0		
55.0	5	115.0	0	175.0	0		
56.0	4	116.0	0	176.0	0		
57.0	3	117.0	0	177.0	0		
58.0	3	118.0	0	178.0	0		
59.0	2	119.0	0	179.0	0		

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5-DEGREE ZONAL LUMEN SUMMARY

0- 5	37
5- 10	103
10- 15	148
15- 20	155
20- 25	125
25- 30	80
30- 35	45
35- 40	23
40- 45	11
45- 50	7
50- 55	4
55- 60	1
60- 65	0
65- 70	0
70- 75	0
75- 80	0
80- 85	0
85- 90	0
90- 95	0
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	140
0- 20	443
0- 30	648
0- 40	716
0- 50	734
0- 60	739
0- 70	740
0- 80	740
0- 90	740
0-100	740
0-110	740
0-120	740
0-130	740
0-140	740
0-150	740
0-160	740
0-170	740
0-180	740

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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	114	112	110	108	112	110	108	106	106	104	103	102	101	100	99	98	97	95
2	110	105	102	99	108	104	101	98	101	98	96	98	96	94	95	93	92	90
3	105	100	95	92	103	98	94	91	96	93	90	93	91	89	91	89	87	86
4	101	95	90	86	99	93	89	86	91	88	85	90	86	84	88	85	83	82
5	97	90	85	81	95	89	84	81	87	83	80	86	82	80	84	81	79	78
6	93	86	81	77	92	85	80	77	83	79	76	82	79	76	81	78	75	74
7	90	82	77	73	88	81	76	73	80	76	73	79	75	72	78	74	72	71
8	86	78	73	70	85	78	73	70	77	72	69	76	72	69	75	71	69	68
9	83	75	70	67	82	74	70	66	74	69	66	73	69	66	72	68	66	65
10	80	72	67	64	79	71	67	64	71	66	63	70	66	63	69	66	63	62

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 TEST SAMPLE.

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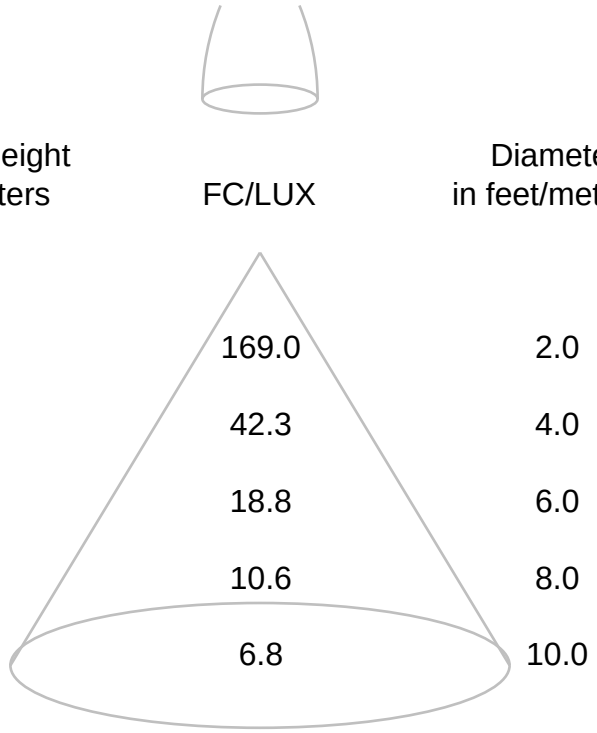
CONE OF LIGHT DIAGRAM

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



Mounting Height in feet/meters	FC/LUX	Diameter in feet/meters
3.0	169.0	2.0
6.0	42.3	4.0
9.0	18.8	6.0
12.0	10.6	8.0
15.0	6.8	10.0

If distances are feet, results are footcandles.
If distances are meters, results are lux.

RAB LIGHTING

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DATE: 9/13/2018
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
CATALOG NUMBER: CDL2[WD, WU, S, PC, PS]-10W40D935-ODLENS

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: EXTRUDED BLACK PAINTED ALUMINUM HOUSING, 1 WHITE CIRCUIT BOARD WITH ONE LED, POLYCARBONATE TIR LENS ON TOP OF THE LED, ALUMINUM TRIM DOOR WITH GLASS LENS.

LAMP: ONE WHITE LIGHT EMITTING DIODES (LEDS).

DRIVER: RDP-010-3EV40-A026

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	3/08/19
OCEAN OPTICS QE65PRO Spectroradiometer	08/22/19
RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry	08/22/19

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

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	740 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4082
Chromaticity Ordinate y	0.3920
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2370
Chromaticity Ordinate v'	0.5122
Correlated Color Temp CCT (K)	3448
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	2533 *
ELECTRICAL	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.049
Input Power (Watts)	11.8
Input Power Factor (%)	87.2
Input Current THD (%)	26.6
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	62.7
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.095
Input Power (Watts)	11.2
Input Power Factor (%)	98.7
Input Current THD (%)	13.6
Input Voltage THD (%)	0.2
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	92
R1 Light greyish red	92
R2 Dark greyish yellow	95
R3 Strong yellowish green	95
R4 Moderate yellowish green	91
R5 Light bluish green	91
R6 Light blue	92
R7 Light violet	94
R8 Light reddish purple	84
R9 Strong red	62
R10 Strong yellow	85
R11 Strong green	90
R12 Strong blue	72
R13 Light yellowish pink (skin)	92
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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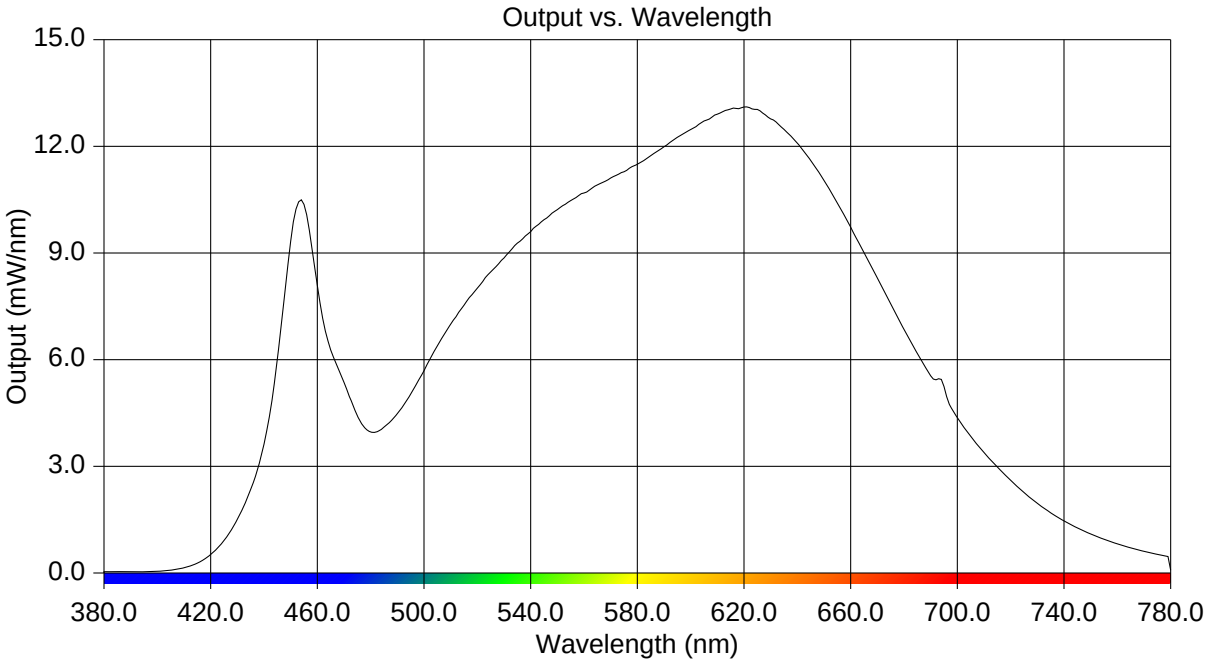
RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.036	515	7.531	650	11.040
385	0.034	520	8.011	655	10.416
390	0.033	525	8.466	660	9.728
395	0.037	530	8.859	665	9.008
400	0.049	535	9.278	670	8.294
405	0.078	540	9.600	675	7.567
410	0.148	545	9.936	680	6.855
415	0.277	550	10.219	685	6.172
420	0.523	555	10.473	690	5.546
425	0.913	560	10.688	695	5.245
430	1.510	565	10.915	700	4.360
435	2.351	570	11.109	705	3.852
440	3.629	575	11.285	710	3.379
445	6.020	580	11.499	715	2.982
450	9.328	585	11.735	720	2.606
455	10.366	590	11.988	725	2.263
460	8.089	595	12.253	730	1.956
465	6.275	600	12.479	735	1.692
470	5.361	605	12.712	740	1.458
475	4.427	610	12.904	745	1.265
480	3.972	615	13.050	750	1.103
485	4.104	620	13.107	755	0.951
490	4.478	625	13.038	760	0.819
495	5.021	630	12.771	765	0.706
500	5.687	635	12.477	770	0.608
505	6.382	640	12.080	775	0.524
510	7.007	645	11.591	780	0.078



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CIE Chromaticity Diagram