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TESTING
NVLAP LAB CODE: 201058-0

REPORT NUMBER: RAB04532 **PAGE:** 1 OF 6
ISSUE DATE: 08/15/18 **DATE SAMPLE TESTED:** 08/15/18
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
CATALOG NUMBER: CDL2[WD, S, PC, PS]-10W40D927-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 = 11.7 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: 24.0
NVLAP LAB CODE: ACCREDITED LABORATORY CODE 201058-0

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.

Checked *X.CAO*

Approved *D.WANG-MUNSON*

REPORT NUMBER: RAB04532 **PAGE:** 2 OF 6
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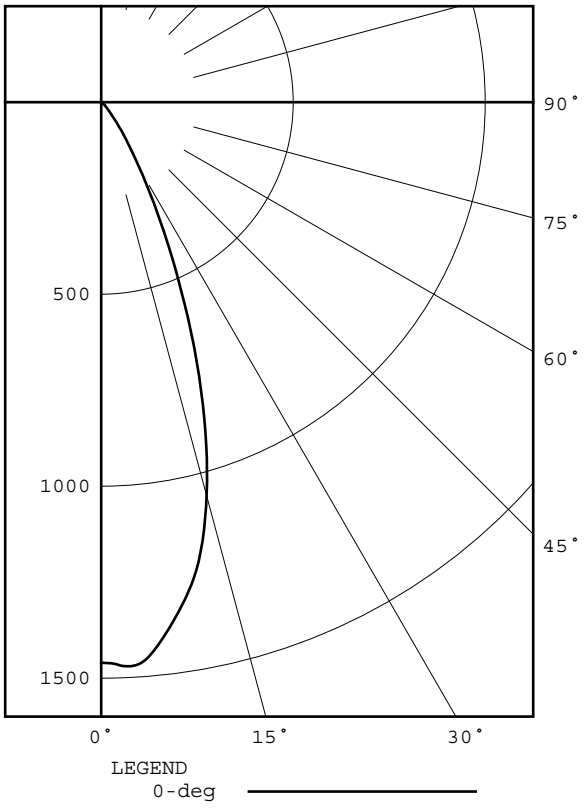
CATALOG NUMBER: CDL2[WD, S, PC, PS]-10W40D927-ODLENS

DEG	CANDELA	LUMENS
0	1460	
5	1447	133
15	1061	288
25	417	194
35	97	63
45	21	17
55	5	5
65	0	0
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	615	88.0
0- 40	678	96.9
0- 60	699	100.0
0- 90	699	100.0
90-120	0	0.0
90-130	0	0.0
90-150	0	0.0
90-180	0	0.0
0-180	699	100.0

EFFICACY = 59.7 lm/W
CIE TYPE - DIRECT
SPACING CRITERION: 0.63



REPORT NUMBER: RAB04532 **PAGE:** 3 OF 6
ISSUE DATE: 08/15/18 **DATE SAMPLE TESTED:** 08/15/18
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CATALOG NUMBER: CDL2[WD, S, PC, PS]-10W40D927-ODLENS

CANDELA DISTRIBUTION

0.0	1460	60.0	1	120.0	0	180.0	0
1.0	1461	61.0	1	121.0	0		
2.0	1468	62.0	0	122.0	0		
3.0	1471	63.0	0	123.0	0		
4.0	1465	64.0	0	124.0	0		
5.0	1447	65.0	0	125.0	0		
6.0	1421	66.0	0	126.0	0		
7.0	1392	67.0	0	127.0	0		
8.0	1362	68.0	0	128.0	0		
9.0	1330	69.0	0	129.0	0		
10.0	1299	70.0	0	130.0	0		
11.0	1263	71.0	0	131.0	0		
12.0	1221	72.0	0	132.0	0		
13.0	1173	73.0	0	133.0	0		
14.0	1119	74.0	0	134.0	0		
15.0	1061	75.0	0	135.0	0		
16.0	1000	76.0	0	136.0	0		
17.0	937	77.0	0	137.0	0		
18.0	869	78.0	0	138.0	0		
19.0	803	79.0	0	139.0	0		
20.0	736	80.0	0	140.0	0		
21.0	667	81.0	0	141.0	0		
22.0	600	82.0	0	142.0	0		
23.0	534	83.0	0	143.0	0		
24.0	474	84.0	0	144.0	0		
25.0	417	85.0	0	145.0	0		
26.0	366	86.0	0	146.0	0		
27.0	320	87.0	0	147.0	0		
28.0	278	88.0	0	148.0	0		
29.0	240	89.0	0	149.0	0		
30.0	205	90.0	0	150.0	0		
31.0	174	91.0	0	151.0	0		
32.0	149	92.0	0	152.0	0		
33.0	129	93.0	0	153.0	0		
34.0	112	94.0	0	154.0	0		
35.0	97	95.0	0	155.0	0		
36.0	82	96.0	0	156.0	0		
37.0	67	97.0	0	157.0	0		
38.0	55	98.0	0	158.0	0		
39.0	46	99.0	0	159.0	0		
40.0	39	100.0	0	160.0	0		
41.0	33	101.0	0	161.0	0		
42.0	29	102.0	0	162.0	0		
43.0	26	103.0	0	163.0	0		
44.0	23	104.0	0	164.0	0		
45.0	21	105.0	0	165.0	0		
46.0	18	106.0	0	166.0	0		
47.0	16	107.0	0	167.0	0		
48.0	14	108.0	0	168.0	0		
49.0	13	109.0	0	169.0	0		
50.0	11	110.0	0	170.0	0		
51.0	10	111.0	0	171.0	0		
52.0	9	112.0	0	172.0	0		
53.0	7	113.0	0	173.0	0		
54.0	6	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	2	118.0	0	178.0	0		
59.0	1	119.0	0	179.0	0		

REPORT NUMBER: RAB04532 **PAGE:** 4 OF 6
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CATALOG NUMBER: CDL2[WD, S, PC, PS]-10W40D927-ODLENS

5-DEGREE ZONAL LUMEN SUMMARY

0- 5	35
5- 10	98
10- 15	140
15- 20	147
20- 25	118
25- 30	76
30- 35	42
35- 40	21
40- 45	10
45- 50	6
50- 55	3
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	133
0- 20	421
0- 30	615
0- 40	678
0- 50	695
0- 60	699
0- 70	699
0- 80	699
0- 90	699
0-100	699
0-110	699
0-120	699
0-130	699
0-140	699
0-150	699
0-160	699
0-170	699
0-180	699

REPORT NUMBER: RAB04532 **PAGE:** 5 OF 6
ISSUE DATE: 08/15/18 **DATE SAMPLE TESTED:** 08/15/18
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
CATALOG NUMBER: CDL2[WD, S, PC, PS]-10W40D927-ODLENS

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

REPORT NUMBER: RAB04532 **PAGE:** 6 OF 6
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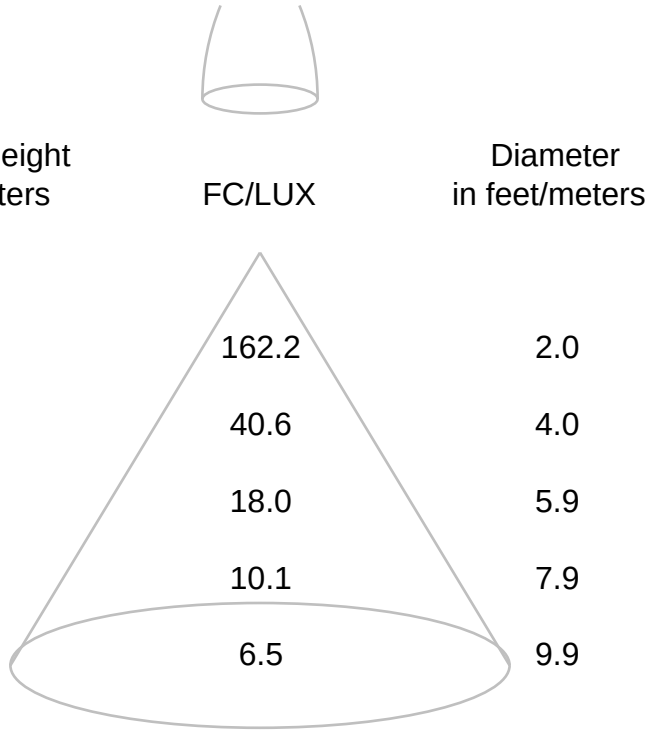
CATALOG NUMBER: CDL2[WD, S, PC, PS]-10W40D927-ODLENS

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	162.2	2.0
6.0	40.6	4.0
9.0	18.0	5.9
12.0	10.1	7.9
15.0	6.5	9.9

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

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TESTING
NVLAP LAB CODE: 201058-0

REPORT NUMBER: RAB04546
DATE: 8/22/2018
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
CATALOG NUMBER: CDL2[WD, WU, S, PC, PS]-10W40D927-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

RAB LIGHTING

NVLAP TESTING
NVLAP LAB CODE: 201058-0

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DATE: 8/22/2018
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CATALOG NUMBER: CDL2[WD, WU, S, PC, PS]-10W40D927-ODLENS

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	699 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4629
Chromaticity Ordinate y	0.4136
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2631
Chromaticity Ordinate v'	0.5290
Correlated Color Temp CCT (K)	2681
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	2475 *
ELECTRICAL	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.048
Input Power (Watts)	11.7
Input Power Factor (%)	88.0
Input Current THD (%)	25.9
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	59.7
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.093
Input Power (Watts)	11.1
Input Power Factor (%)	99.1
Input Current THD (%)	10.8
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	96
R3 Strong yellowish green	98
R4 Moderate yellowish green	92
R5 Light bluish green	92
R6 Light blue	96
R7 Light violet	92
R8 Light reddish purple	80
R9 Strong red	57
R10 Strong yellow	89
R11 Strong green	93
R12 Strong blue	83
R13 Light yellowish pink (skin)	93
R14 Moderate olive green (leaf)	98

*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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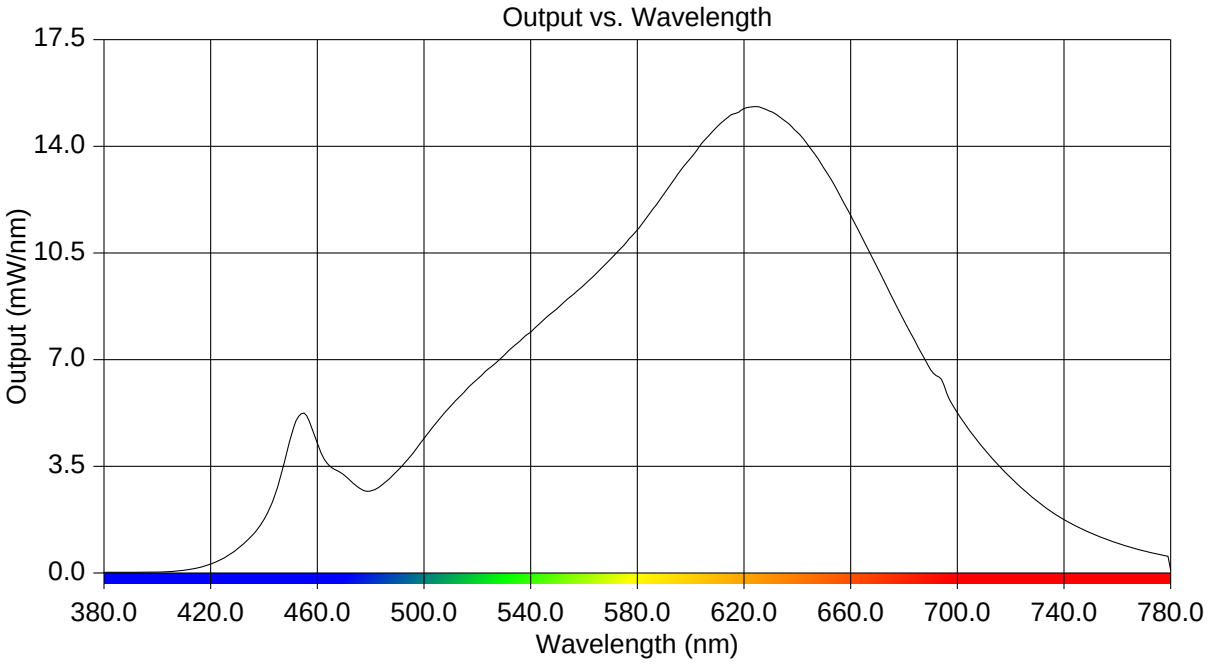
CATALOG NUMBER: CDL2[WD, WU, S, PC, PS]-10W40D927-ODLENS

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.020	515	5.928	650	13.277
385	0.021	520	6.358	655	12.551
390	0.023	525	6.753	660	11.733
395	0.027	530	7.136	665	10.901
400	0.031	535	7.540	670	10.028
405	0.047	540	7.901	675	9.139
410	0.087	545	8.314	680	8.282
415	0.164	550	8.684	685	7.459
420	0.296	555	9.072	690	6.668
425	0.491	560	9.451	695	6.164
430	0.784	565	9.860	700	5.259
435	1.184	570	10.311	705	4.632
440	1.753	575	10.756	710	4.068
445	2.814	580	11.259	715	3.578
450	4.438	585	11.840	720	3.131
455	5.247	590	12.438	725	2.715
460	4.263	595	13.065	730	2.350
465	3.482	600	13.615	735	2.027
470	3.214	605	14.184	740	1.749
475	2.834	610	14.648	745	1.513
480	2.693	615	15.028	750	1.315
485	2.946	620	15.238	755	1.137
490	3.353	625	15.307	760	0.977
495	3.837	630	15.140	765	0.841
500	4.408	635	14.865	770	0.724
505	4.970	640	14.462	775	0.622
510	5.480	645	13.924	780	0.093



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CIE Chromaticity Diagram