

REPORT NUMBER: RAB04618

PAGE: 1 OF 6

ISSUE DATE: 09/07/18

DATE SAMPLE TESTED: 09/07/18

PREPARED FOR: RAB LIGHTING INC. RC LIGHTING

CATALOG NUMBER: CDL6 [WD, S, PC, PS] -20W80D927-ODLENS

LUMINAIRE: EXTRUDED BLACK PAINTED METAL HOUSING, CAST FINNED METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH 1 LED, MOLDED PLASTIC UPPER REFLECTOR, HOLOGRAPHIC PLASTIC LENS OVER UPPER APERTURE OF LOWER REFLECTOR, 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 = 20.2 W AT 277.0 VAC.

LED DRIVER: LED DRIVER: RDD-30W-042SE-A0500

PROCEDURE: TEST PROCEDURE: IESNA LM-79-08

NOTE: LM-80 DATA AVAILABLE FROM MANUFACTURER FOR SOLID STATE SOURCE
AMBIENT: 24.3

NVLAP LAB CODE: ACCREDITED LABORATORY CODE 201058-0



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Checked X.CAO

Approved D.WANG-MUNSON

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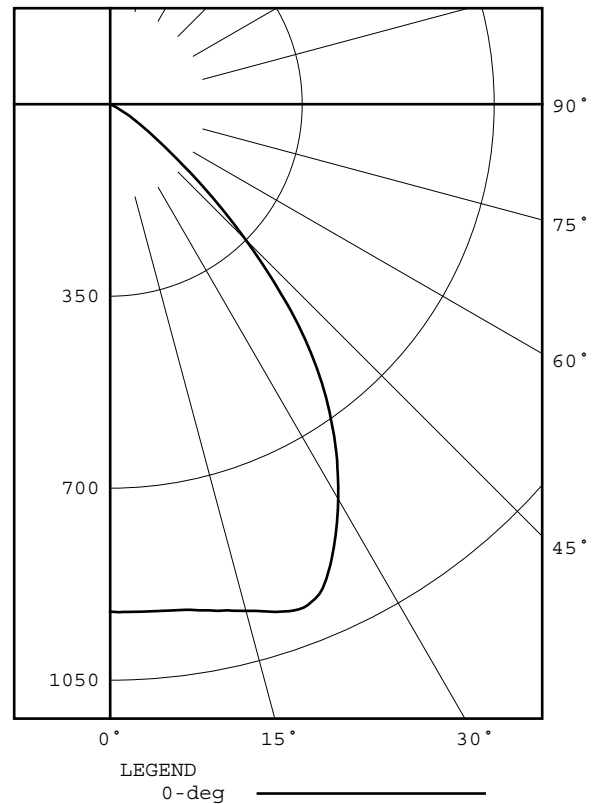
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CATALOG NUMBER: CDL6 [WD, S, PC, PS] -20W80D927-ODLENS

DEG	CANDELA	LUMENS
0	925	
5	928	89
15	956	272
25	941	428
35	702	435
45	349	269
55	77	75
65	3	7
75	1	1
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 ZONE	LUMEN LUMENS	SUMMARY %FIXT
0- 30	789	50.0
0- 40	1224	77.6
0- 60	1568	99.5
0- 90	1577	100.0
90-120	0	0.0
90-130	0	0.0
90-150	0	0.0
90-180	0	0.0
0-180	1577	100.0

EFFICACY = 78.1 lm/W
CIE TYPE - DIRECT
SPACING CRITERION: 1.21



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CANDELA DISTRIBUTION

0.0	925	60.0	28	120.0	0	180.0	0
1.0	926	61.0	21	121.0	0		
2.0	926	62.0	14	122.0	0		
3.0	927	63.0	9	123.0	0		
4.0	927	64.0	6	124.0	0		
5.0	928	65.0	3	125.0	0		
6.0	928	66.0	2	126.0	0		
7.0	930	67.0	2	127.0	0		
8.0	931	68.0	1	128.0	0		
9.0	933	69.0	1	129.0	0		
10.0	937	70.0	1	130.0	0		
11.0	940	71.0	1	131.0	0		
12.0	944	72.0	1	132.0	0		
13.0	947	73.0	1	133.0	0		
14.0	952	74.0	1	134.0	0		
15.0	956	75.0	1	135.0	0		
16.0	961	76.0	1	136.0	0		
17.0	967	77.0	1	137.0	0		
18.0	973	78.0	1	138.0	0		
19.0	978	79.0	1	139.0	0		
20.0	982	80.0	1	140.0	0		
21.0	983	81.0	1	141.0	0		
22.0	979	82.0	0	142.0	0		
23.0	972	83.0	0	143.0	0		
24.0	959	84.0	0	144.0	0		
25.0	941	85.0	0	145.0	0		
26.0	922	86.0	0	146.0	0		
27.0	900	87.0	0	147.0	0		
28.0	877	88.0	0	148.0	0		
29.0	855	89.0	0	149.0	0		
30.0	832	90.0	0	150.0	0		
31.0	806	91.0	0	151.0	0		
32.0	782	92.0	0	152.0	0		
33.0	757	93.0	0	153.0	0		
34.0	730	94.0	0	154.0	0		
35.0	702	95.0	0	155.0	0		
36.0	674	96.0	0	156.0	0		
37.0	645	97.0	0	157.0	0		
38.0	613	98.0	0	158.0	0		
39.0	579	99.0	0	159.0	0		
40.0	545	100.0	0	160.0	0		
41.0	508	101.0	0	161.0	0		
42.0	466	102.0	0	162.0	0		
43.0	428	103.0	0	163.0	0		
44.0	388	104.0	0	164.0	0		
45.0	349	105.0	0	165.0	0		
46.0	311	106.0	0	166.0	0		
47.0	274	107.0	0	167.0	0		
48.0	241	108.0	0	168.0	0		
49.0	208	109.0	0	169.0	0		
50.0	176	110.0	0	170.0	0		
51.0	148	111.0	0	171.0	0		
52.0	126	112.0	0	172.0	0		
53.0	107	113.0	0	173.0	0		
54.0	91	114.0	0	174.0	0		
55.0	77	115.0	0	175.0	0		
56.0	66	116.0	0	176.0	0		
57.0	55	117.0	0	177.0	0		
58.0	45	118.0	0	178.0	0		
59.0	36	119.0	0	179.0	0		

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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	22
5- 10	67
10- 15	112
15- 20	160
20- 25	204
25- 30	224
30- 35	226
35- 40	209
40- 45	165
45- 50	104
50- 55	52
55- 60	23
60- 65	6
65- 70	1
70- 75	1
75- 80	1
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	89
0- 20	361
0- 30	789
0- 40	1224
0- 50	1493
0- 60	1568
0- 70	1575
0- 80	1576
0- 90	1577
0-100	1577
0-110	1577
0-120	1577
0-130	1577
0-140	1577
0-150	1577
0-160	1577
0-170	1577
0-180	1577

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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	111	106	106	106	102	102	102	100
1	113	109	107	104	110	107	105	102	103	101	99	99	99	98	96	96	95	94	92
2	106	100	96	92	104	98	94	91	95	92	89	92	89	87	89	87	85	85	83
3	99	92	86	81	97	90	85	81	88	83	79	85	81	78	83	80	77	75	75
4	93	84	78	73	91	83	77	72	81	76	71	79	74	71	77	73	70	68	68
5	87	77	71	65	85	76	70	65	74	69	65	73	68	64	71	67	63	62	62
6	82	71	64	59	80	70	64	59	69	63	59	67	62	58	66	61	58	56	56
7	77	66	59	54	75	65	58	54	64	58	53	62	57	53	61	56	53	51	51
8	72	61	54	49	71	60	54	49	59	53	49	58	53	49	57	52	48	47	47
9	68	57	50	45	67	56	50	45	55	49	45	54	49	45	53	48	45	43	43
10	64	53	46	42	63	52	46	42	51	45	41	51	45	41	50	45	41	40	40

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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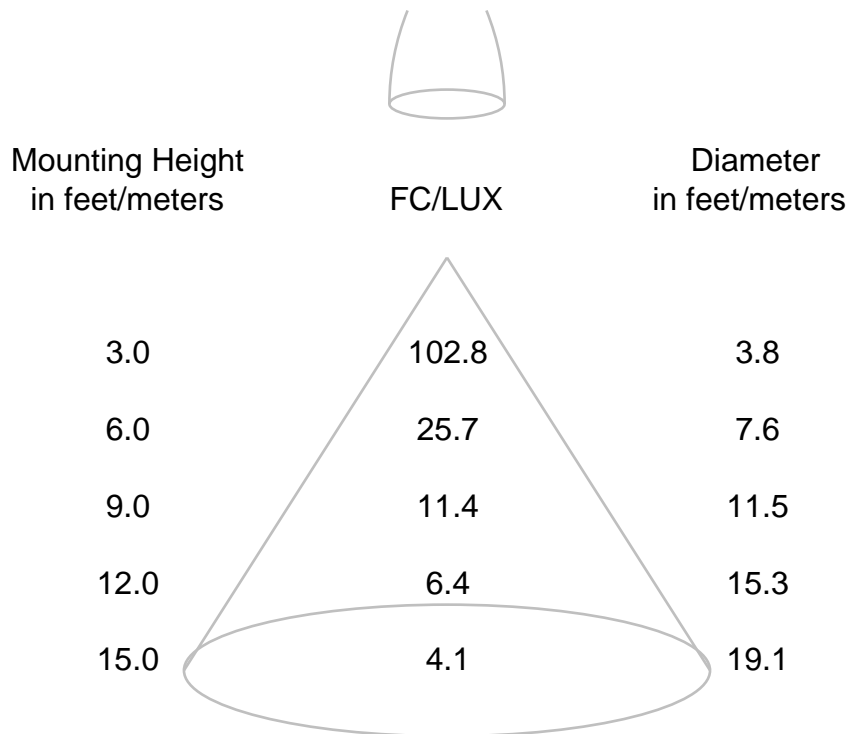
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CONE OF LIGHT DIAGRAM

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



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

REPORT NUMBER: RAB04619
DATE: 9/10/2018
PREPARED FOR: RAB LIGHTING INC. RC LIGHTING
CATALOG NUMBER: CDL6 [WD, WU, S, PC, PS] -20W80D927-ODLENS

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: EXTRUDED BLACK PAINTED METAL HOUSING, CAST FINNED METAL HEAT SINK, 1 WHITE CIRCUIT BOARD WITH 1 LED, MOLDED PLASTIC UPPER REFLECTOR, HOLOGRAPHIC PLASTIC LENS OVER UPPER APERTURE OF LOWER REFLECTOR, ALUMINUM TRIM DOOR WITH GLASS LENS.

LAMP: ONE WHITE LIGHT EMITTING DIODES (LEDS).

DRIVER: RDD-30W-042SE-A0500

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: 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
Calibration Due:

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

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RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	1577 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4603
Chromaticity Ordinate y	0.4167
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2601
Chromaticity Ordinate v'	0.5297
Correlated Color Temp CCT (K)	2741
ANSI C78.377-2008 Duv	0.002
Total Radiant Flux (milliWatts)	5441 *
ELECTRICAL	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.081
Input Power (Watts)	20.2
Input Power Factor (%)	89.7
Input Current THD (%)	19.4
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
78.1	
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.165
Input Power (Watts)	19.5
Input Power Factor (%)	98.6
Input Current THD (%)	12.0
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
0.0	

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	91
R1 Light greyish red	90
R2 Dark greyish yellow	95
R3 Strong yellowish green	99
R4 Moderate yellowish green	90
R5 Light bluish green	90
R6 Light blue	94
R7 Light violet	91
R8 Light reddish purple	78
R9 Strong red	51
R10 Strong yellow	87
R11 Strong green	90
R12 Strong blue	79
R13 Light yellowish pink (skin)	91
R14 Moderate olive green (leaf)	99

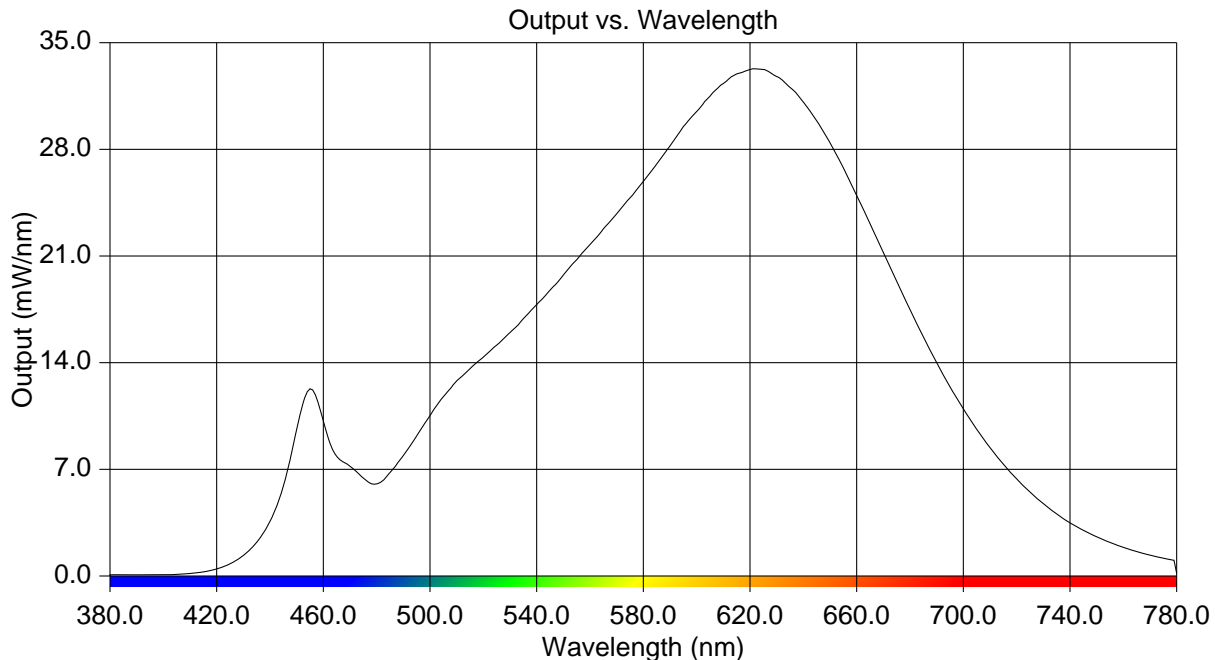
*NOTE:

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	0.074	515	13.604	650	28.404
385	0.077	520	14.359	655	26.789
390	0.072	525	15.149	660	24.978
395	0.074	530	15.983	665	23.117
400	0.081	535	16.885	670	21.245
405	0.105	540	17.809	675	19.359
410	0.159	545	18.767	680	17.485
415	0.268	550	19.743	685	15.710
420	0.472	555	20.750	690	13.961
425	0.796	560	21.758	695	12.411
430	1.340	565	22.781	700	10.979
435	2.203	570	23.790	705	9.625
440	3.583	575	24.814	710	8.427
445	5.910	580	25.898	715	7.332
450	9.600	585	27.004	720	6.377
455	12.286	590	28.241	725	5.505
460	10.174	595	29.490	730	4.732
465	7.850	600	30.478	735	4.074
470	7.199	605	31.486	740	3.488
475	6.419	610	32.320	745	2.992
480	6.044	615	32.948	750	2.583
485	6.795	620	33.241	755	2.201
490	7.904	625	33.248	760	1.877
495	9.191	630	32.776	765	1.606
500	10.523	635	32.079	770	1.370
505	11.755	640	31.114	775	1.169
510	12.806	645	29.869	780	0.174



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CIE Chromaticity Diagram

