

REPORT NUMBER: ITL82329

PAGE: 1 OF 5

ISSUE DATE: 07/24/14

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: TRLED2X2-50N/D10

LUMINAIRE: FABRICATED METAL HOUSING WITH WHITE PAINTED INTERIOR FINISH, FORMED WHITE PAINTED METAL DRIVER COVER, 4 WHITE CIRCUIT BOARDS EACH WITH 32 LEDS, CLEAR FLAT PRISMATIC PLASTIC LENS IN FABRICATED WHITE PAINTED METAL FRAME. LENS PRISMS OUT.

LAMPS: ONE HUNDRED TWENTY-EIGHT WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.

TOTAL INPUT WATTS = 51.1 AT 120.0 VOLTS

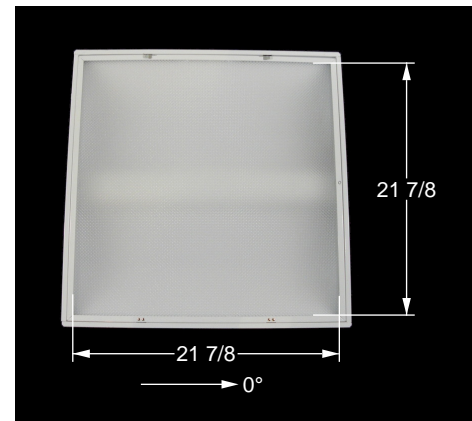
MOUNTING: RECESSED

LED DRIVER: RAB LIGHTING RDD-050W-450G, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE DRIVER. DRIVER INFORMATION PROVIDED BY CLIENT.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET



#### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	
0	1893	1893	1893	1893	1893	
5	1881	1883	1883	1881	1879	178
15	1772	1776	1782	1784	1786	501
25	1561	1567	1579	1587	1592	725
35	1271	1277	1289	1301	1304	804
45	946	949	954	962	961	737
55	637	637	637	636	636	572
65	396	392	385	385	391	389
75	233	226	223	224	228	239
85	85	82	81	76	80	85
90	0	0	0	0	0	

#### FLUX

#### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	1404	33.2
0- 40	2209	52.2
0- 60	3517	83.1
0- 90	4230	100.0
90-180	0	0.0
0-180	4230	100.0

EFFICACY = 82.8 lm/W

CIE TYPE - DIRECT

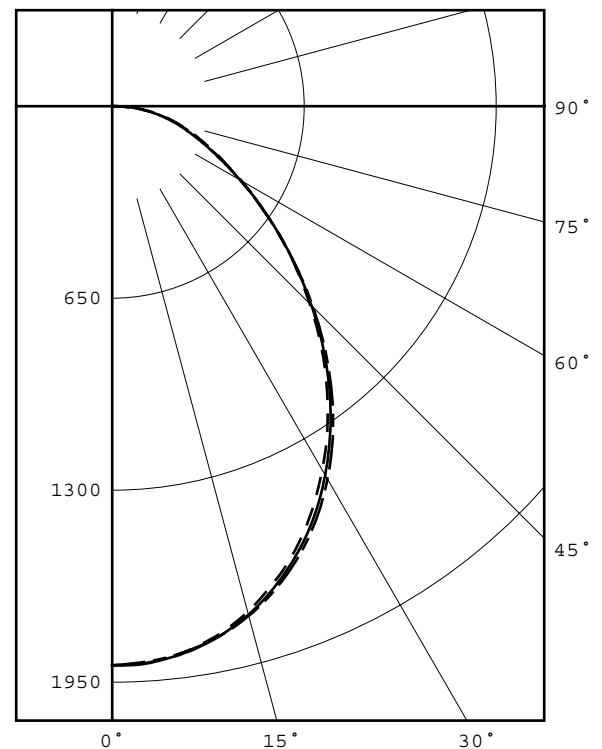
PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.13 1.15

LUMINOUS LENGTH : 21.875 21.875

#### LUMINANCE DATA IN CANDELA/SQ M

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	4334.	4370.	4402.
55	3597.	3597.	3592.
65	3035.	2951.	2997.
75	2916.	2791.	2853.
85	3159.	3010.	2973.



#### LEGEND:

0-deg - - - - -  
45-deg - - - - -  
90-deg - - - - -

Checked B. HYRE  
Approved R. BEATTIE  
Lighting Engineer



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CANDELA DISTRIBUTION  
LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1893	1893	1893	1893	1893
2.5	1891	1893	1893	1890	1887
5.0	1881	1883	1883	1881	1879
7.5	1864	1866	1868	1866	1864
10.0	1840	1843	1846	1844	1845
12.5	1810	1813	1817	1818	1819
15.0	1772	1776	1782	1784	1786
17.5	1727	1733	1740	1744	1747
20.0	1678	1683	1691	1699	1701
22.5	1623	1628	1638	1646	1650
25.0	1561	1567	1579	1587	1592
27.5	1493	1501	1513	1523	1528
30.0	1422	1430	1442	1455	1457
32.5	1351	1356	1367	1380	1383
35.0	1271	1277	1289	1301	1304
37.5	1193	1197	1208	1218	1221
40.0	1112	1115	1124	1134	1135
42.5	1029	1032	1039	1048	1048
45.0	946	949	954	962	961
47.5	864	868	871	877	875
50.0	787	788	790	794	791
52.5	710	711	712	712	712
55.0	637	637	637	636	636
57.5	568	567	567	563	565
60.0	506	502	500	497	500
62.5	446	444	440	438	442
65.0	396	392	385	385	391
67.5	350	345	338	339	345
70.0	308	302	296	298	304
72.5	270	263	258	260	266
75.0	233	226	223	224	228
77.5	197	190	187	187	191
80.0	161	155	152	151	155
82.5	123	118	117	113	118
85.0	85	82	81	76	80
87.5	42	42	40	36	35
90.0	0	0	0	0	0



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5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	45
5- 10	133
10- 15	215
15- 20	286
20- 25	343
25- 30	382
30- 35	402
35- 40	402
40- 45	385
45- 50	352
50- 55	310
55- 60	262
60- 65	215
65- 70	174
70- 75	137
75- 80	101
80- 85	64
85- 90	22

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	178
0- 20	679
0- 30	1404
0- 40	2209
0- 50	2945
0- 60	3517
0- 70	3906
0- 80	4145
0- 90	4230



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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	105	101	97	107	103	99	96	98	95	93	95	92	90	91	89	87	85
2	100	92	86	81	98	91	85	80	87	82	78	84	80	76	81	77	74	72
3	92	82	74	68	90	81	73	68	78	72	67	75	70	65	72	68	64	62
4	85	73	65	59	83	72	64	58	70	63	58	67	62	57	65	60	56	54
5	78	66	58	51	76	65	57	51	63	56	51	61	55	50	59	54	49	47
6	73	60	51	45	71	59	51	45	57	50	45	56	49	44	54	48	44	42
7	68	55	46	40	66	54	46	40	52	45	40	51	45	40	50	44	40	38
8	63	50	42	36	62	50	42	36	48	41	36	47	41	36	46	40	36	34
9	59	46	38	33	58	46	38	33	45	38	33	44	37	33	43	37	33	31
10	56	43	35	30	54	42	35	30	41	35	30	40	34	30	40	34	30	28

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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ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

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REPORT NUMBER: ITL82341  
DATE: 07/30/14  
PREPARED FOR: RAB LIGHTING, INC.  
CATALOG NUMBER: TRLED2X2-50N/D10

ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

LUMINAIRE: FABRICATED METAL HOUSING WITH WHITE PAINTED INTERIOR FINISH, FORMED WHITE PAINTED METAL DRIVER COVER, 4 WHITE CIRCUIT BOARDS EACH WITH 32 LEDS, CLEAR FLAT PRISMATIC PLASTIC LENS IN FABRICATED WHITE PAINTED METAL FRAME. LENS PRISMS OUT.

LAMP: ONE HUNDRED TWENTY-EIGHT WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.

DRIVER: RAB LIGHTING RDD-050W-450G, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120.0 AND 277.0 VAC, 60Hz) TO THE DRIVER. DRIVER INFORMATION PROVIDED BY CLIENT.

INSTRUMENTS:	Associated Power Technologies APT5040 AC Power Source	Calibration Due: N/A
	Yokogawa WT210 Digital Power Meter #8	12/31/14
	Ocean Optics QE65000 Spectroradiometer	07/14/15
	ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry	07/14/15

OBJECT OF TEST: Measure the Total Radiant Flux\*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRI<sub>a</sub>,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. Report Off-State Power. Measure electrical data including Total Harmonic Distortion (THD) at maximum rated voltage.

PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere 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 120.0 VAC input. Electrical data was also recorded at maximum nominal rated input voltage (277.0 VAC). All testing performed in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. 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)

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Checked	<i>N THOMAS</i>
Approved	<i>P O'CONNOR</i> Sphere Lab Supervisor



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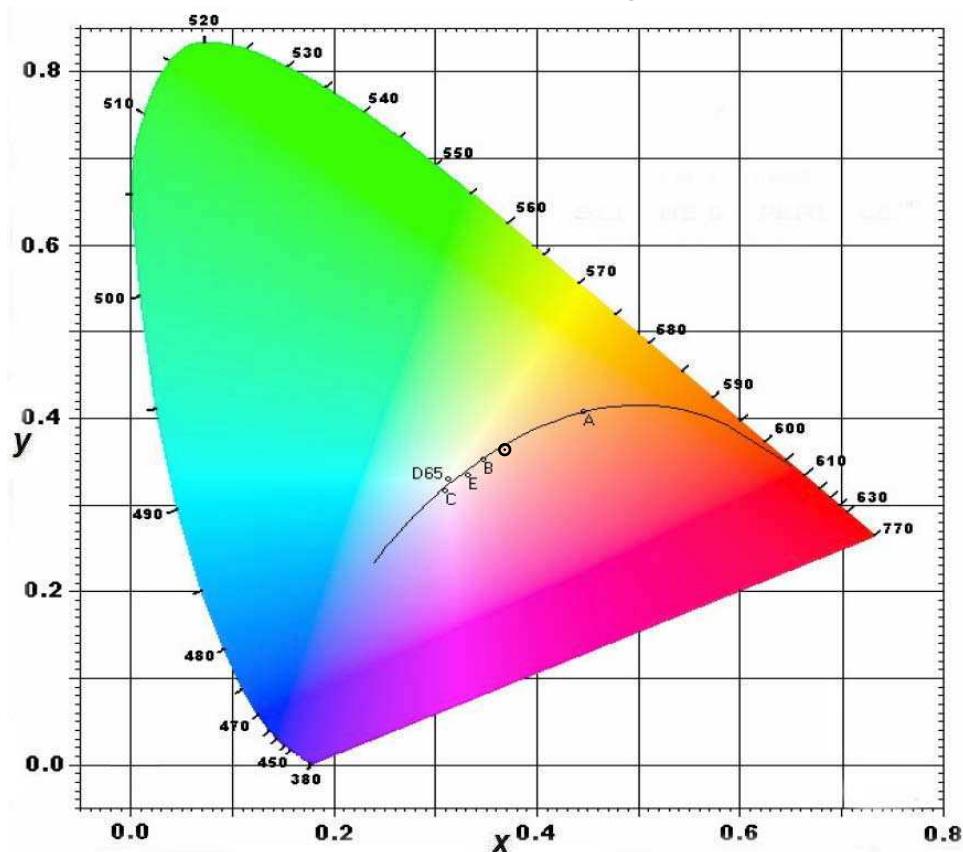
NVLAP<sup>®</sup>  
NVLAP LAB CODE: 200925-0

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## CIE Chromaticity Diagram



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RESULTS:

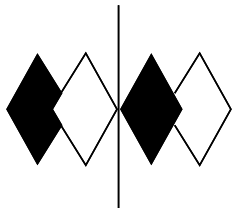
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3681
Chromaticity Ordinate y	0.3634
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2223
Chromaticity Ordinate v'	0.4937
Correlated Color Temp CCT (K)	4264
ANSI C78.377-2008 Duv	-0.003
Total Radiant Flux (milliWatts)	13632 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.429
Input Power (Watts)	51.1
Input Power Factor (%)	99.3
Input Current THD (%)	10.8
Input Voltage THD (%)	0.1
Off-State Power (Watts)	
	0.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.199
Input Power (Watts)	50.2
Input Power Factor (%)	91.1
Input Current THD (%)	13.4
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	82
R2 Dark greyish yellow	88
R3 Strong yellowish green	90
R4 Moderate yellowish green	83
R5 Light bluish green	82
R6 Light blue	82
R7 Light violet	88
R8 Light reddish purple	72
R9 Strong red	25
R10 Strong yellow	69
R11 Strong green	80
R12 Strong blue	58
R13 Light yellowish pink (skin)	83
R14 Moderate olive green (leaf)	94

\*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	0.379	515	45.556	650	42.225
385	0.376	520	48.864	655	38.941
390	0.392	525	51.553	660	35.711
395	0.459	530	53.918	665	32.548
400	0.589	535	55.957	670	29.533
405	0.840	540	57.921	675	26.622
410	1.364	545	59.918	680	23.874
415	2.436	550	61.854	685	21.311
420	4.539	555	63.686	690	18.939
425	8.618	560	65.329	695	16.795
430	15.915	565	66.758	700	14.825
435	27.480	570	67.861	705	13.031
440	45.210	575	68.659	710	11.433
445	72.653	580	69.120	715	9.983
450	94.816	585	69.352	720	8.691
455	83.983	590	69.165	725	7.558
460	56.998	595	68.641	730	6.560
465	41.320	600	67.840	735	5.690
470	30.854	605	66.563	740	4.937
475	22.695	610	64.870	745	4.280
480	19.411	615	62.850	750	3.707
485	19.716	620	60.456	755	3.210
490	22.028	625	57.761	760	2.772
495	26.188	630	54.903	765	2.395
500	31.434	635	51.932	770	2.069
505	36.746	640	48.777	775	1.787
510	41.510	645	45.533	780	1.546

