

REPORT NUMBER: ITL82332

PAGE: 1 OF 5

ISSUE DATE: 07/30/14

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: TRLED2X4-37N/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 = 37.9 AT 120.0 VOLTS

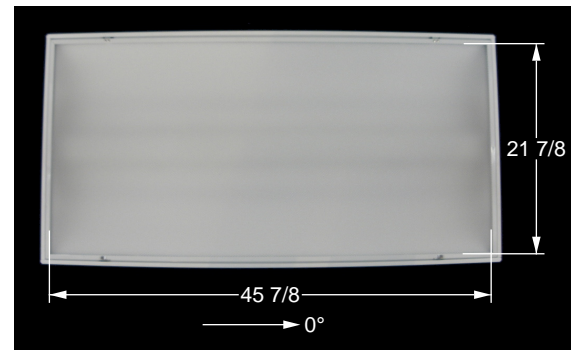
MOUNTING: RECESSED

LED DRIVER: RAB LIGHTING RDD-037W-350G,  
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 = 35.0 FEET



#### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	FLUX
0	1487	1487	1487	1487	1487	140
5	1478	1481	1479	1478	1478	396
15	1405	1409	1406	1405	1406	578
25	1255	1260	1257	1258	1258	650
35	1039	1043	1042	1039	1038	604
45	786	788	783	779	777	477
55	538	538	533	525	524	328
65	335	332	326	322	326	203
75	194	191	188	191	195	74
85	69	66	70	71	75	
90	0	0	0	0	0	

#### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	1114	32.3
0- 40	1764	51.1
0- 60	2846	82.5
0- 90	3451	100.0
90-180	0	0.0
0-180	3451	100.0

EFFICACY = 91.1 lm/W

CIE TYPE - DIRECT

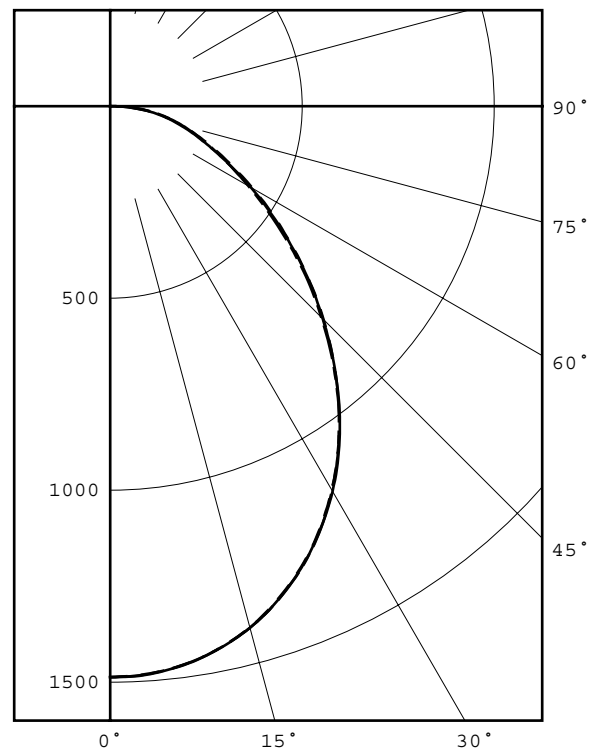
PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.16 1.16

LUMINOUS LENGTH : 45.875 21.875

#### LUMINANCE DATA IN CANDELA/SQ M

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	1717.	1710.	1697.
55	1449.	1435.	1411.
65	1224.	1191.	1191.
75	1158.	1122.	1164.
85	1223.	1241.	1329.



LEGEND:

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

Checked B. HYRE  
Approved R. BEATTIE  
Lighting Engineer



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4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

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# CANDELA DISTRIBUTION LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1487	1487	1487	1487	1487
2.5	1484	1487	1486	1484	1485
5.0	1478	1481	1479	1478	1478
7.5	1467	1470	1468	1467	1467
10.0	1451	1454	1452	1451	1451
12.5	1430	1434	1431	1430	1431
15.0	1405	1409	1406	1405	1406
17.5	1374	1379	1376	1376	1376
20.0	1338	1343	1340	1341	1341
22.5	1299	1304	1301	1301	1302
25.0	1255	1260	1257	1258	1258
27.5	1206	1212	1209	1208	1209
30.0	1154	1159	1158	1156	1155
32.5	1098	1103	1102	1100	1099
35.0	1039	1043	1042	1039	1038
37.5	978	982	980	977	976
40.0	914	918	914	912	910
42.5	850	853	849	846	844
45.0	786	788	783	779	777
47.5	722	724	720	714	714
50.0	659	660	656	648	649
52.5	597	598	593	586	585
55.0	538	538	533	525	524
57.5	483	482	477	468	468
60.0	429	427	423	413	415
62.5	380	378	372	365	368
65.0	335	332	326	322	326
67.5	295	292	286	286	289
70.0	259	256	250	252	255
72.5	225	222	218	221	224
75.0	194	191	188	191	195
77.5	165	161	160	162	166
80.0	134	130	131	133	137
82.5	104	99	102	103	108
85.0	69	66	70	71	75
87.5	33	32	35	36	37
90.0	0	0	0	0	0



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5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	35
5- 10	105
10- 15	170
15- 20	226
20- 25	273
25- 30	306
30- 35	324
35- 40	326
40- 45	314
45- 50	290
50- 55	257
55- 60	220
60- 65	181
65- 70	147
70- 75	116
75- 80	87
80- 85	55
85- 90	19

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	140
0- 20	536
0- 30	1114
0- 40	1764
0- 50	2368
0- 60	2846
0- 70	3174
0- 80	3376
0- 90	3451



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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	102	99	95	98	95	92	94	92	89	91	89	87	85
2	100	92	86	80	97	90	84	79	87	82	77	84	79	76	81	77	74	72
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	72	67	64	62
4	84	73	65	58	82	72	64	58	69	62	57	67	61	56	65	60	55	53
5	78	66	57	51	76	65	56	50	62	55	50	61	54	49	59	53	49	47
6	72	59	51	45	70	59	50	45	57	50	44	55	49	44	54	48	43	41
7	67	54	46	40	66	53	45	40	52	45	39	50	44	39	49	43	39	37
8	63	50	41	36	61	49	41	36	48	41	36	46	40	35	45	39	35	33
9	59	46	38	32	57	45	38	32	44	37	32	43	37	32	42	36	32	30
10	55	42	35	30	54	42	35	30	41	34	29	40	34	29	39	33	29	27

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: ITL82344  
DATE: 07/31/14  
PREPARED FOR: RAB LIGHTING, INC.  
CATALOG NUMBER: TRLED2X4-37N/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-037W-350G, 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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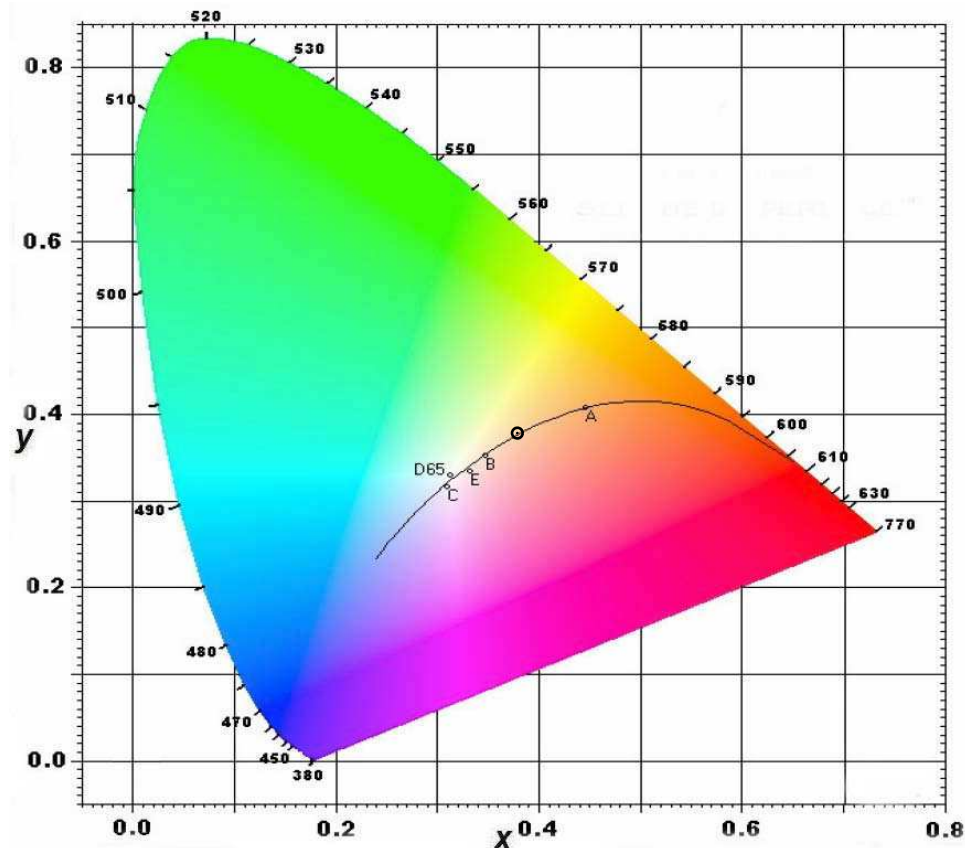
**NVLAP**  
NVLAP LAB CODE: 200925-0

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## CIE Chromaticity Diagram



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RESULTS:

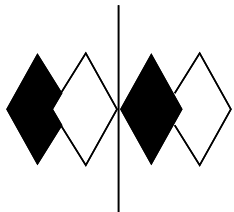
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3786
Chromaticity Ordinate y	0.3779
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2235
Chromaticity Ordinate v'	0.5018
Correlated Color Temp CCT (K)	4057
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	10918 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.318
Input Power (Watts)	37.9
Input Power Factor (%)	99.3
Input Current THD (%)	10.4
Input Voltage THD (%)	0.3
Off-State Power (Watts)	
	0.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.145
Input Power (Watts)	37.7
Input Power Factor (%)	93.9
Input Current THD (%)	12.5
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	81
R2 Dark greyish yellow	88
R3 Strong yellowish green	93
R4 Moderate yellowish green	81
R5 Light bluish green	81
R6 Light blue	83
R7 Light violet	88
R8 Light reddish purple	70
R9 Strong red	21
R10 Strong yellow	72
R11 Strong green	79
R12 Strong blue	56
R13 Light yellowish pink (skin)	83
R14 Moderate olive green (leaf)	96

\*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	0.303	515	36.650	650	35.245
385	0.297	520	39.312	655	32.499
390	0.311	525	41.459	660	29.890
395	0.332	530	43.358	665	27.323
400	0.384	535	45.027	670	24.830
405	0.506	540	46.676	675	22.410
410	0.743	545	48.355	680	20.109
415	1.240	550	49.997	685	17.936
420	2.222	555	51.600	690	15.935
425	4.157	560	53.165	695	14.109
430	7.811	565	54.450	700	12.455
435	13.992	570	55.446	705	10.940
440	23.786	575	56.157	710	9.583
445	40.539	580	56.652	715	8.357
450	61.861	585	56.949	720	7.275
455	67.158	590	56.943	725	6.333
460	49.868	595	56.678	730	5.498
465	35.370	600	56.107	735	4.776
470	27.812	605	55.182	740	4.151
475	21.129	610	53.916	745	3.601
480	17.221	615	52.215	750	3.124
485	16.984	620	50.203	755	2.709
490	18.648	625	48.017	760	2.342
495	21.580	630	45.643	765	2.016
500	25.506	635	43.185	770	1.741
505	29.692	640	40.611	775	1.507
510	33.454	645	37.961	780	1.302

