

REPORT NUMBER: ITL82324

PAGE: 1 OF 5

ISSUE DATE: 07/28/14

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: TRLED2X2-37Y/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 = 38.6 AT 120.0 VOLTS

MOUNTING: RECESSED

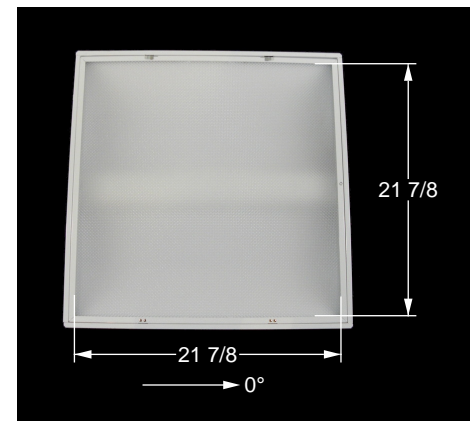
LED DRIVER: RAB LIGHTING RDD-037W-350G, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST.

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 = 20.0 FEET



#### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0
0	1469	1469	1469	1469	1469
5	1461	1462	1463	1463	1462
15	1382	1385	1391	1394	1397
25	1224	1229	1241	1248	1254
35	995	1002	1013	1021	1025
45	723	728	733	737	736
55	468	467	464	457	455
65	275	268	261	263	269
75	161	155	153	155	164
85	57	53	54	55	59
90	0	0	0	0	0

#### FLUX

139
391
569
631
564
416
268
165
59

#### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	1099	34.3
0- 40	1730	54.0
0- 60	2710	84.7
0- 90	3201	100.0
90-180	0	0.0
0-180	3201	100.0

EFFICACY = 82.9 lm/W

CIE TYPE - DIRECT

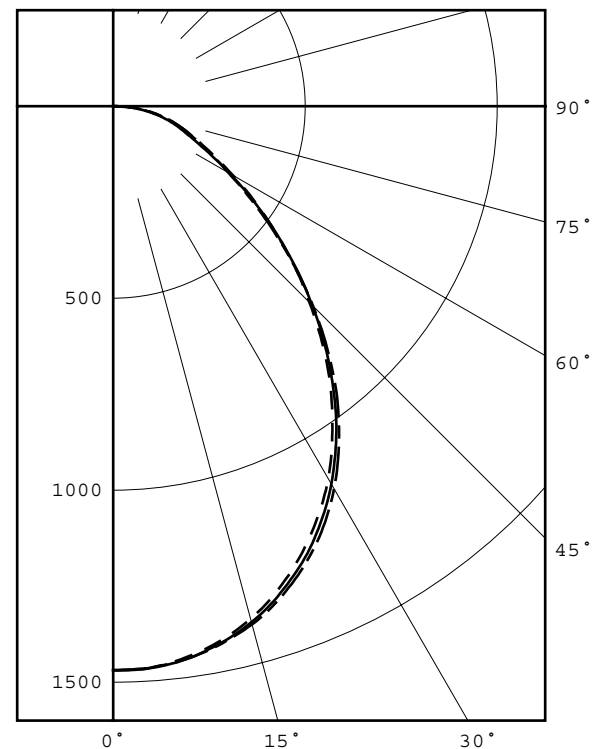
PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.15 1.17

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	3312.	3358.	3372.
55	2643.	2620.	2570.
65	2108.	2000.	2062.
75	2015.	1915.	2053.
85	2118.	2007.	2193.



#### LEGEND:

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

Checked B. HYRE  
Approved R. BEATTIE  
Lighting Engineer



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PAGE: 2 OF 5

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# CANDELA DISTRIBUTION LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1469	1469	1469	1469	1469
2.5	1468	1469	1469	1468	1467
5.0	1461	1462	1463	1463	1462
7.5	1448	1450	1453	1452	1452
10.0	1431	1434	1436	1437	1438
12.5	1409	1411	1416	1417	1419
15.0	1382	1385	1391	1394	1397
17.5	1350	1353	1361	1364	1369
20.0	1312	1317	1325	1331	1335
22.5	1270	1276	1286	1291	1297
25.0	1224	1229	1241	1248	1254
27.5	1174	1178	1191	1198	1205
30.0	1120	1124	1136	1145	1150
32.5	1059	1065	1076	1085	1090
35.0	995	1002	1013	1021	1025
37.5	931	935	945	954	958
40.0	863	866	875	880	885
42.5	793	797	804	809	811
45.0	723	728	733	737	736
47.5	658	659	663	663	661
50.0	591	591	594	591	588
52.5	527	528	528	521	519
55.0	468	467	464	457	455
57.5	413	409	405	398	398
60.0	359	356	351	346	347
62.5	314	309	302	301	305
65.0	275	268	261	263	269
67.5	241	235	227	232	238
70.0	212	206	199	205	212
72.5	186	180	176	180	188
75.0	161	155	153	155	164
77.5	136	130	129	131	139
80.0	109	105	104	107	113
82.5	84	79	79	81	87
85.0	57	53	54	55	59
87.5	27	25	25	26	25
90.0	0	0	0	0	0



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NVLAP LAB CODE: 200925-0

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PAGE: 3 OF 5

5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	35
5- 10	104
10- 15	168
15- 20	224
20- 25	269
25- 30	300
30- 35	316
35- 40	315
40- 45	297
45- 50	267
50- 55	228
55- 60	187
60- 65	149
65- 70	119
70- 75	94
75- 80	70
80- 85	44
85- 90	15

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	139
0- 20	530
0- 30	1099
0- 40	1730
0- 50	2294
0- 60	2710
0- 70	2978
0- 80	3143
0- 90	3201



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PAGE: 4 OF 5

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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	110	105	101	98	107	103	99	96	99	96	93	95	93	90	91	89	88	86
2	101	93	87	82	98	91	86	81	88	83	79	85	81	77	82	78	75	73
3	93	83	75	69	90	81	74	69	78	72	68	76	71	66	73	69	65	63
4	85	74	66	60	83	73	65	60	71	64	59	68	63	58	66	61	57	55
5	79	67	59	52	77	66	58	52	64	57	52	62	56	51	60	55	51	49
6	73	61	52	46	72	60	52	46	58	51	46	57	50	45	55	49	45	43
7	68	56	47	42	67	55	47	41	53	46	41	52	46	41	51	45	41	39
8	64	51	43	37	62	50	43	37	49	42	37	48	42	37	47	41	37	35
9	60	47	39	34	58	46	39	34	45	39	34	44	38	34	43	38	33	32
10	56	44	36	31	55	43	36	31	42	35	31	41	35	31	40	35	31	29

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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PAGE: 5 OF 5

ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

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Page 1 of 4

REPORT NUMBER: ITL82336  
DATE: 07/30/14  
PREPARED FOR: RAB LIGHTING, INC.  
CATALOG NUMBER: TRLED2X2-37Y/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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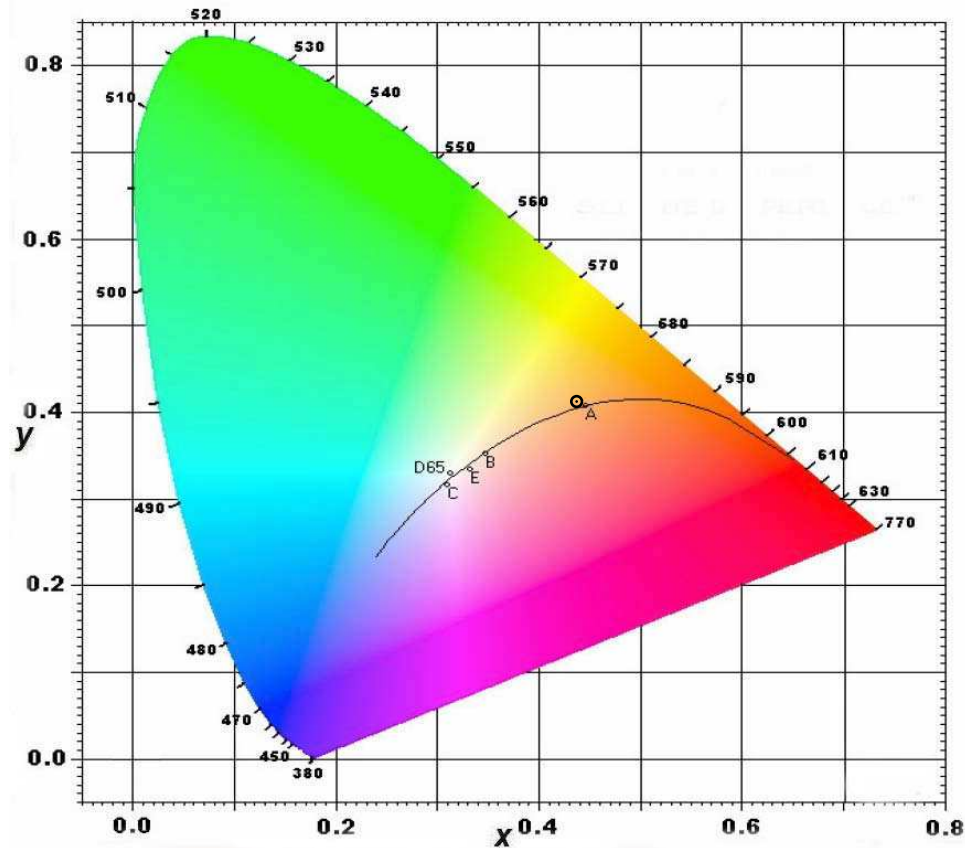
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NVLAP LAB CODE: 200925-0

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Page 4 of 4

## CIE Chromaticity Diagram



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Page 2 of 4

RESULTS:

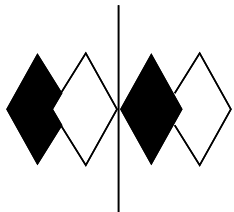
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4370
Chromaticity Ordinate y	0.4120
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2472
Chromaticity Ordinate v'	0.5245
Correlated Color Temp CCT (K)	3063
ANSI C78.377-2008 Duv	0.003
Total Radiant Flux (milliWatts)	10028 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.324
Input Power (Watts)	38.6
Input Power Factor (%)	99.3
Input Current THD (%)	9.8
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.147
Input Power (Watts)	38.3
Input Power Factor (%)	94.1
Input Current THD (%)	13.5
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	79
R2 Dark greyish yellow	88
R3 Strong yellowish green	95
R4 Moderate yellowish green	79
R5 Light bluish green	78
R6 Light blue	83
R7 Light violet	86
R8 Light reddish purple	64
R9 Strong red	14
R10 Strong yellow	71
R11 Strong green	76
R12 Strong blue	60
R13 Light yellowish pink (skin)	80
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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Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.206	515	27.585	650	41.990
385	0.198	520	29.992	655	38.848
390	0.203	525	32.104	660	35.704
395	0.218	530	34.151	665	32.543
400	0.246	535	36.095	670	29.521
405	0.318	540	38.145	675	26.635
410	0.485	545	40.384	680	23.953
415	0.819	550	42.737	685	21.479
420	1.464	555	45.155	690	19.180
425	2.644	560	47.632	695	17.080
430	4.666	565	50.082	700	15.100
435	7.829	570	52.387	705	13.290
440	12.711	575	54.538	710	11.661
445	21.021	580	56.389	715	10.173
450	30.441	585	58.039	720	8.852
455	31.251	590	59.296	725	7.684
460	23.535	595	60.138	730	6.664
465	18.133	600	60.561	735	5.770
470	15.009	605	60.454	740	5.004
475	12.037	610	59.853	745	4.325
480	10.656	615	58.867	750	3.743
485	11.165	620	57.339	755	3.239
490	12.729	625	55.398	760	2.799
495	15.225	630	53.184	765	2.406
500	18.392	635	50.722	770	2.075
505	21.733	640	47.948	775	1.790
510	24.817	645	45.025	780	1.547

