

REPORT NUMBER: ITL82326

PAGE: 1 OF 5

ISSUE DATE: 07/28/14

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: TRLED2X2-37N/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 = 38.0 AT 120.0 VOLTS

MOUNTING: RECESSED

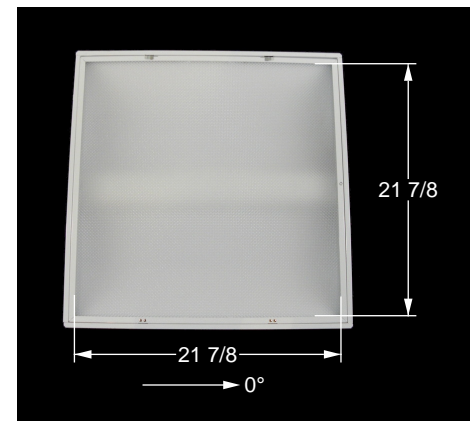
LED DRIVER: RAB LIGHTING RDD-037W-350G, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST.

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	1511	1511	1511	1511	1511	
5	1501	1502	1503	1500	1501	142
15	1413	1417	1421	1423	1424	400
25	1244	1250	1257	1266	1268	578
35	1015	1019	1028	1036	1040	641
45	757	756	761	764	766	587
55	507	505	509	505	507	455
65	316	311	306	306	311	310
75	185	181	177	179	181	190
85	68	64	64	59	64	68
90	0	0	0	0	0	

FLUX

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	1120	33.2
0- 40	1761	52.3
0- 60	2802	83.2
0- 90	3370	100.0
90-180	0	0.0
0-180	3370	100.0

EFFICACY = 88.7 lm/W

CIE TYPE - DIRECT

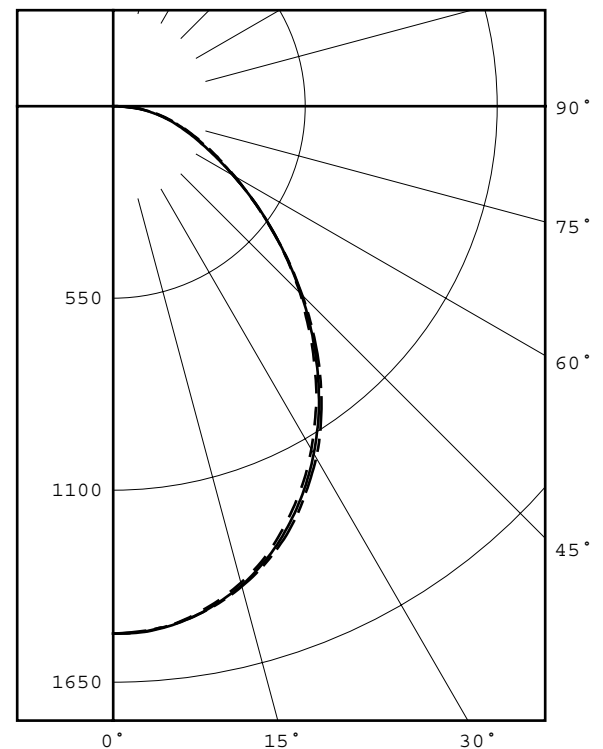
PLANE : 0-DEG 90-DEG

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	3468.	3486.	3509.
55	2863.	2875.	2863.
65	2422.	2345.	2384.
75	2315.	2215.	2265.
85	2527.	2379.	2379.



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	1511	1511	1511	1511	1511
2.5	1510	1510	1510	1507	1507
5.0	1501	1502	1503	1500	1501
7.5	1488	1489	1490	1489	1489
10.0	1467	1470	1472	1472	1472
12.5	1443	1446	1448	1451	1451
15.0	1413	1417	1421	1423	1424
17.5	1380	1382	1387	1392	1393
20.0	1339	1342	1349	1355	1357
22.5	1293	1299	1305	1313	1316
25.0	1244	1250	1257	1266	1268
27.5	1192	1198	1205	1215	1216
30.0	1135	1141	1149	1159	1163
32.5	1075	1081	1090	1099	1104
35.0	1015	1019	1028	1036	1040
37.5	949	955	962	970	974
40.0	884	889	896	902	906
42.5	818	823	829	833	836
45.0	757	756	761	764	766
47.5	692	691	695	696	698
50.0	629	627	630	629	631
52.5	565	565	568	565	567
55.0	507	505	509	505	507
57.5	452	450	451	448	451
60.0	402	400	398	395	399
62.5	357	353	350	348	352
65.0	316	311	306	306	311
67.5	279	274	268	270	275
70.0	245	241	235	237	241
72.5	214	210	204	207	210
75.0	185	181	177	179	181
77.5	156	152	149	149	152
80.0	128	122	121	120	123
82.5	100	94	94	89	94
85.0	68	64	64	59	64
87.5	33	33	32	28	29
90.0	0	0	0	0	0



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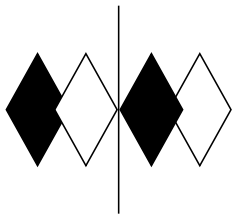
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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	36
5- 10	106
10- 15	171
15- 20	228
20- 25	273
25- 30	305
30- 35	320
35- 40	321
40- 45	306
45- 50	280
50- 55	246
55- 60	208
60- 65	171
65- 70	138
70- 75	109
75- 80	81
80- 85	51
85- 90	17

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	142
0- 20	542
0- 30	1120
0- 40	1761
0- 50	2348
0- 60	2802
0- 70	3112
0- 80	3302
0- 90	3370



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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	93	86	81	98	91	85	80	87	82	78	84	80	76	81	78	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	52	45	71	59	51	45	57	50	45	56	49	44	54	48	44	42
7	68	55	46	41	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	41	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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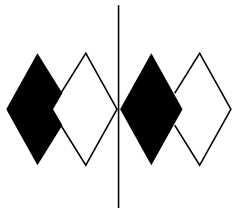
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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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REPORT NUMBER: ITL82338
DATE: 07/30/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X2-37N/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_a,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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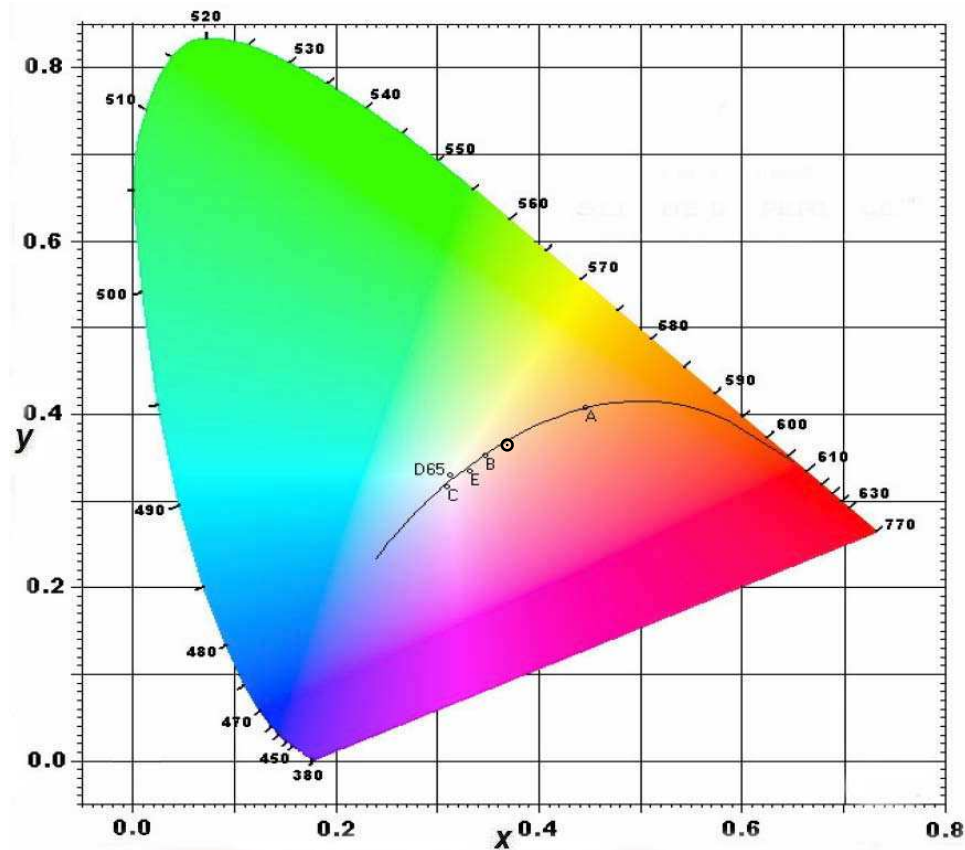
NVLAP
NVLAP LAB CODE: 200925-0

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CIE Chromaticity Diagram



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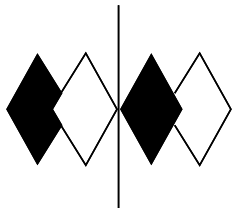
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3686
Chromaticity Ordinate y	0.3642
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2223
Chromaticity Ordinate v'	0.4942
Correlated Color Temp CCT (K)	4254
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	10838 *
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 (%)	10.3
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 (%)	12.8
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	57
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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NVLAP LAB CODE: 200925-0

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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.305	515	36.436	650	33.683
385	0.283	520	39.041	655	31.052
390	0.311	525	41.149	660	28.489
395	0.355	530	42.994	665	25.968
400	0.438	535	44.584	670	23.542
405	0.628	540	46.131	675	21.193
410	1.005	545	47.734	680	19.008
415	1.772	550	49.275	685	16.962
420	3.310	555	50.701	690	15.065
425	6.344	560	52.023	695	13.344
430	11.902	565	53.163	700	11.781
435	20.872	570	54.038	705	10.341
440	35.247	575	54.672	710	9.069
445	58.394	580	55.035	715	7.906
450	76.929	585	55.203	720	6.876
455	66.893	590	55.084	725	5.972
460	44.596	595	54.684	730	5.186
465	32.459	600	54.007	735	4.491
470	24.147	605	53.013	740	3.893
475	17.611	610	51.681	745	3.369
480	15.153	615	50.094	750	2.918
485	15.520	620	48.202	755	2.526
490	17.425	625	46.067	760	2.185
495	20.824	630	43.800	765	1.883
500	25.100	635	41.439	770	1.620
505	29.417	640	38.909	775	1.402
510	33.192	645	36.319	780	1.210

