

REPORT NUMBER: ITL82325

PAGE: 1 OF 5

ISSUE DATE: 07/28/14

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: TRLED2X2-37YN/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 = 37.5 AT 120.0 VOLTS

MOUNTING: RECESSED

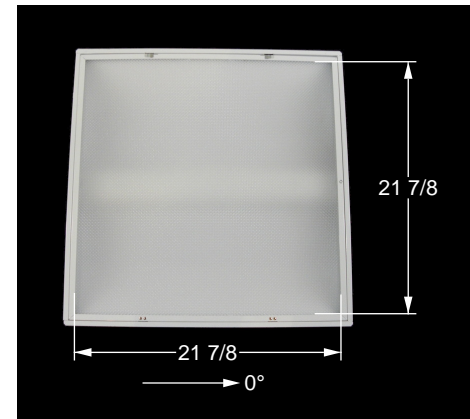
LED DRIVER: RAB LIGHTING RDD-037W-350G, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST.

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	1496	1496	1496	1496	1496	
5	1486	1487	1488	1485	1484	141
15	1400	1402	1407	1410	1411	396
25	1233	1237	1247	1254	1259	572
35	1003	1008	1018	1024	1029	634
45	745	747	751	755	756	579
55	502	497	499	498	497	448
65	310	303	298	299	303	302
75	180	174	171	172	178	184
85	65	62	60	57	60	65
90	0	0	0	0	0	

FLUX

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	1109	33.4
0- 40	1744	52.5
0- 60	2770	83.4
0- 90	3322	100.0
90-180	0	0.0
0-180	3322	100.0

EFFICACY = 88.6 lm/W

CIE TYPE - DIRECT

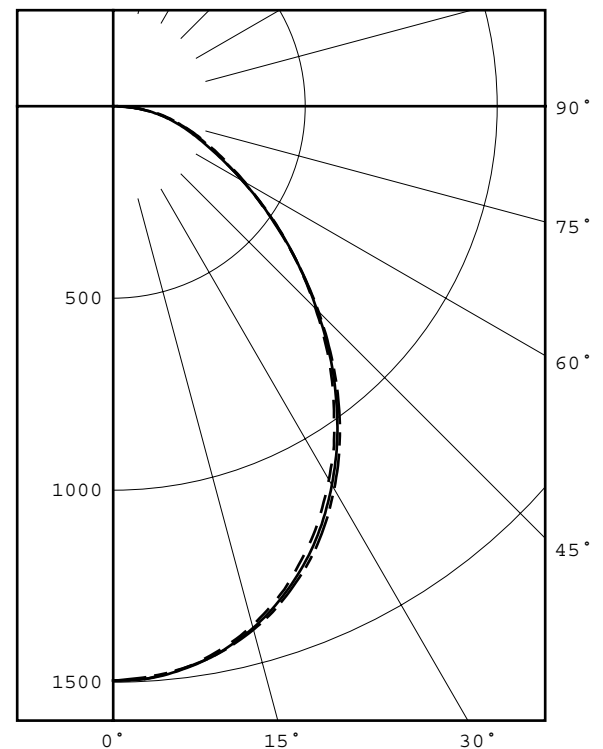
PLANE : 0-DEG 90-DEG

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	3413.	3440.	3463.
55	2835.	2818.	2807.
65	2376.	2284.	2322.
75	2253.	2140.	2228.
85	2416.	2230.	2230.



LEGEND:

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

Checked B. HYRE
Approved R. BEATTIE
Lighting Engineer



INDEPENDENT TESTING LABORATORIES, INC.
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	1496	1496	1496	1496	1496
2.5	1495	1496	1495	1492	1491
5.0	1486	1487	1488	1485	1484
7.5	1473	1474	1475	1474	1473
10.0	1453	1455	1458	1458	1458
12.5	1429	1431	1435	1436	1437
15.0	1400	1402	1407	1410	1411
17.5	1365	1368	1374	1378	1381
20.0	1326	1329	1336	1342	1344
22.5	1280	1285	1294	1301	1304
25.0	1233	1237	1247	1254	1259
27.5	1179	1185	1195	1203	1207
30.0	1123	1130	1139	1147	1151
32.5	1067	1070	1080	1087	1092
35.0	1003	1008	1018	1024	1029
37.5	941	944	953	959	963
40.0	877	879	887	891	895
42.5	811	813	819	822	825
45.0	745	747	751	755	756
47.5	683	682	685	688	687
50.0	620	618	621	623	621
52.5	560	557	559	557	557
55.0	502	497	499	498	497
57.5	445	442	443	441	441
60.0	396	391	390	388	390
62.5	350	344	341	341	343
65.0	310	303	298	299	303
67.5	273	267	261	262	268
70.0	240	234	228	230	236
72.5	210	204	199	201	207
75.0	180	174	171	172	178
77.5	152	146	144	144	148
80.0	125	118	117	116	119
82.5	95	90	89	86	90
85.0	65	62	60	57	60
87.5	31	31	28	27	26
90.0	0	0	0	0	0



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	36
5- 10	105
10- 15	170
15- 20	226
20- 25	271
25- 30	302
30- 35	317
35- 40	317
40- 45	303
45- 50	277
50- 55	243
55- 60	205
60- 65	167
65- 70	135
70- 75	106
75- 80	78
80- 85	49
85- 90	16

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	141
0- 20	537
0- 30	1109
0- 40	1744
0- 50	2323
0- 60	2770
0- 70	3073
0- 80	3257
0- 90	3322



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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	75	73
3	92	82	75	68	90	81	74	68	78	72	67	75	70	66	73	68	64	62
4	85	74	65	59	83	72	65	59	70	63	58	68	62	57	65	60	56	54
5	79	66	58	52	76	65	57	51	63	56	51	61	55	50	59	54	50	48
6	73	60	52	46	71	59	51	45	57	50	45	56	49	45	54	49	44	42
7	68	55	47	41	66	54	46	41	53	45	40	51	45	40	50	44	40	38
8	63	50	42	37	62	50	42	37	48	41	36	47	41	36	46	40	36	34
9	59	46	39	33	58	46	38	33	45	38	33	44	37	33	43	37	33	31
10	56	43	35	30	55	43	35	30	42	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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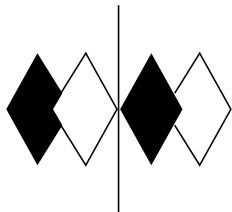
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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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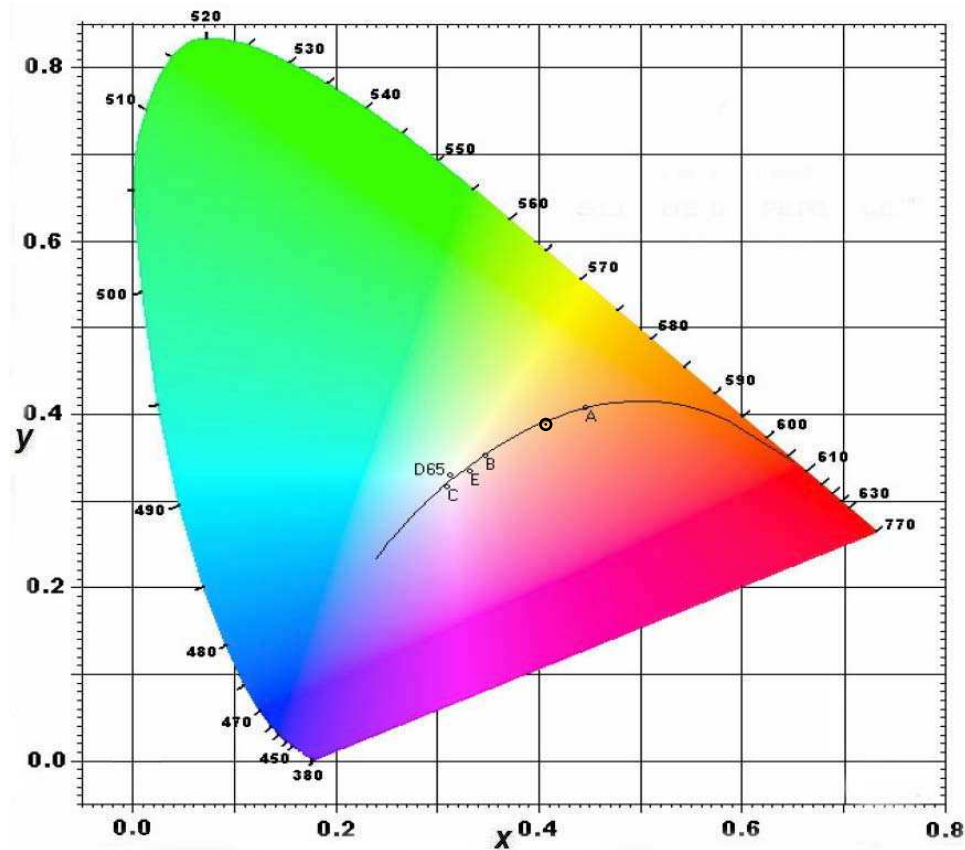
NVLAP
NVLAP LAB CODE: 200925-0

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CIE Chromaticity Diagram



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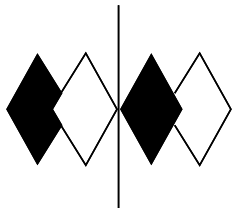
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4066
Chromaticity Ordinate y	0.3879
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2377
Chromaticity Ordinate v'	0.5103
Correlated Color Temp CCT (K)	3448
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	10665 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.315
Input Power (Watts)	37.6
Input Power Factor (%)	99.5
Input Current THD (%)	10.1
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)	0.144
Input Power (Watts)	37.3
Input Power Factor (%)	93.5
Input Current THD (%)	13.1
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	84
R1 Light greyish red	83
R2 Dark greyish yellow	90
R3 Strong yellowish green	95
R4 Moderate yellowish green	82
R5 Light bluish green	82
R6 Light blue	86
R7 Light violet	87
R8 Light reddish purple	69
R9 Strong red	26
R10 Strong yellow	76
R11 Strong green	79
R12 Strong blue	63
R13 Light yellowish pink (skin)	84
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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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.236	515	31.069	650	40.870
385	0.241	520	33.552	655	37.792
390	0.233	525	35.711	660	34.633
395	0.254	530	37.731	665	31.396
400	0.296	535	39.599	670	28.273
405	0.388	540	41.539	675	25.433
410	0.574	545	43.561	680	22.948
415	0.981	550	45.623	685	20.690
420	1.785	555	47.698	690	18.549
425	3.324	560	49.749	695	16.501
430	6.155	565	51.764	700	14.579
435	10.853	570	53.637	705	12.800
440	18.189	575	55.344	710	11.206
445	30.843	580	56.786	715	9.763
450	47.495	585	57.962	720	8.506
455	52.501	590	58.684	725	7.387
460	39.743	595	59.033	730	6.422
465	28.617	600	59.024	735	5.574
470	22.867	605	58.630	740	4.843
475	17.608	610	57.923	745	4.199
480	14.464	615	57.014	750	3.650
485	14.264	620	55.650	755	3.164
490	15.618	625	53.928	760	2.732
495	18.025	630	51.870	765	2.356
500	21.307	635	49.497	770	2.032
505	24.883	640	46.753	775	1.752
510	28.175	645	43.868	780	1.514

