

REPORT NUMBER: ITL82330

PAGE: 1 OF 5

ISSUE DATE: 07/30/14

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: TRLED2X4-37Y/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 = 38.8 AT 120.0 VOLTS

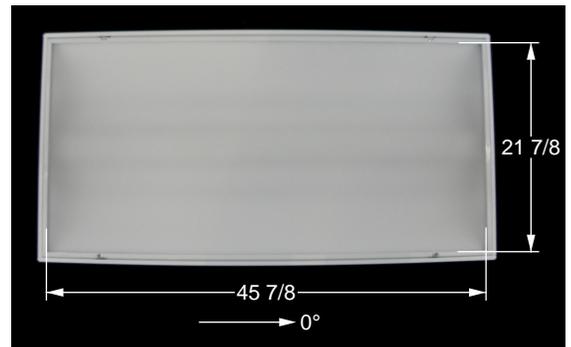
MOUNTING: RECESSED

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	1431	1431	1431	1431	1431	
5	1421	1426	1425	1424	1424	135
15	1352	1357	1355	1354	1354	382
25	1210	1213	1213	1212	1211	557
35	1002	1004	1004	1003	1002	626
45	756	757	756	751	748	582
55	515	514	512	502	500	457
65	320	316	310	308	311	313
75	186	182	179	181	187	193
85	69	65	69	70	74	72
90	0	0	0	0	0	

FLUX

ZONAL LUMEN SUMMARY

ZONE	LUMENS	% FIXT
0- 30	1074	32.4
0- 40	1700	51.3
0- 60	2738	82.6
0- 90	3316	100.0
90-180	0	0.0
0-180	3316	100.0

EFFICACY = 85.5 lm/W

CIE TYPE - DIRECT

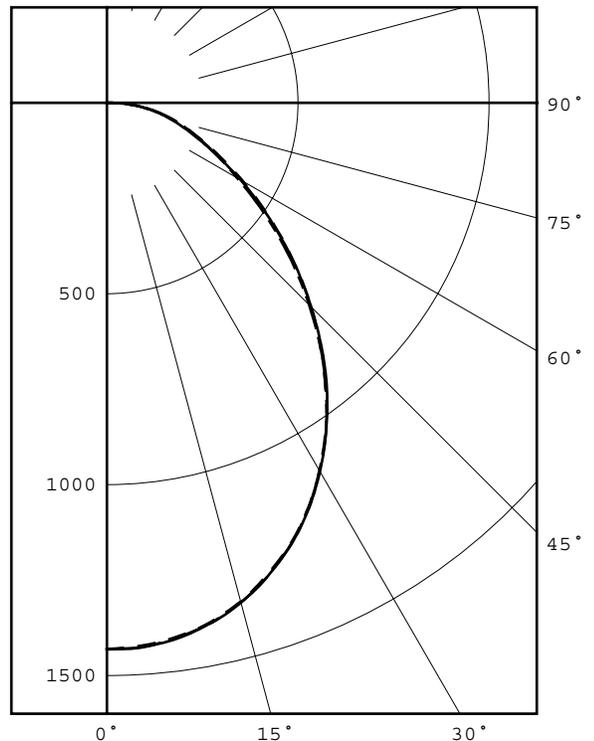
PLANE : 0-DEG 90-DEG

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	1651.	1651.	1634.
55	1387.	1379.	1346.
65	1170.	1133.	1137.
75	1110.	1068.	1116.
85	1223.	1223.	1311.

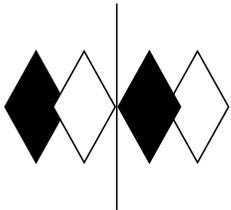


LEGEND:

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

Checked B. HYRE

Approved R. BEATTIE
Lighting Engineer



itl boulder
 THE LIGHT CENTER OF THE INDUSTRY SINCE 1955



INDEPENDENT TESTING LABORATORIES, INC.
 4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL82330
 ISSUE DATE: 07/30/14
 PREPARED FOR: RAB LIGHTING, INC. PAGE: 2 OF 5

CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1431	1431	1431	1431	1431
2.5	1427	1431	1431	1429	1430
5.0	1421	1426	1425	1424	1424
7.5	1410	1416	1415	1413	1413
10.0	1396	1401	1399	1397	1398
12.5	1376	1382	1380	1378	1379
15.0	1352	1357	1355	1354	1354
17.5	1322	1328	1326	1326	1326
20.0	1288	1294	1292	1293	1291
22.5	1252	1256	1255	1255	1254
25.0	1210	1213	1213	1212	1211
27.5	1163	1166	1166	1166	1164
30.0	1112	1115	1115	1115	1112
32.5	1058	1061	1061	1060	1060
35.0	1002	1004	1004	1003	1002
37.5	939	946	946	942	941
40.0	879	884	884	880	878
42.5	815	821	820	815	813
45.0	756	757	756	751	748
47.5	693	695	693	687	684
50.0	632	633	631	623	621
52.5	573	573	570	562	560
55.0	515	514	512	502	500
57.5	462	460	456	446	445
60.0	411	408	404	395	394
62.5	363	360	354	348	351
65.0	320	316	310	308	311
67.5	282	278	271	272	276
70.0	247	243	237	239	243
72.5	216	212	207	209	215
75.0	186	182	179	181	187
77.5	157	153	152	154	159
80.0	128	124	124	126	132
82.5	99	94	97	98	104
85.0	69	65	69	70	74
87.5	33	34	36	37	39
90.0	0	0	0	0	0



INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL82330
ISSUE DATE: 07/30/14
PREPARED FOR: RAB LIGHTING, INC.

PAGE: 3 OF 5

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	34
5- 10	101
10- 15	163
15- 20	218
20- 25	263
25- 30	294
30- 35	312
35- 40	314
40- 45	303
45- 50	279
50- 55	247
55- 60	210
60- 65	173
65- 70	140
70- 75	110
75- 80	82
80- 85	53
85- 90	19

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	135
0- 20	517
0- 30	1074
0- 40	1700
0- 50	2281
0- 60	2738
0- 70	3051
0- 80	3244
0- 90	3316



INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL82330

PAGE: 4 OF 5

ISSUE DATE: 07/30/14

PREPARED FOR: RAB LIGHTING, INC.

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	119	116	116	116	116	111	111	111	111	111	111	106	106	106	102	102	102	100
1	109	105	101	97	107	102	99	95	98	95	92	94	92	90	91	89	87	85	85	85	85	85
2	100	92	86	80	97	90	84	79	87	82	77	84	79	76	81	77	74	72	72	72	72	72
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	72	68	64	62	62	62	62	62
4	84	73	65	58	82	72	64	58	69	62	57	67	61	56	65	60	56	53	53	53	53	53
5	78	66	57	51	76	65	57	50	63	55	50	61	54	49	59	53	49	47	47	47	47	47
6	72	60	51	45	70	59	50	45	57	50	44	55	49	44	54	48	43	41	41	41	41	41
7	67	54	46	40	66	53	45	40	52	45	39	51	44	39	49	43	39	37	37	37	37	37
8	63	50	42	36	61	49	41	36	48	41	36	47	40	35	45	40	35	33	33	33	33	33
9	59	46	38	33	57	45	38	32	44	37	32	43	37	32	42	36	32	30	30	30	30	30
10	55	42	35	30	54	42	35	30	41	34	29	40	34	29	39	33	29	28	28	28	28	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.



itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955



NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL82330
ISSUE DATE: 07/30/14
PREPARED FOR: RAB LIGHTING, INC.

PAGE: 5 OF 5

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

THIS ITL REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.



INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com
Page 1 of 4

REPORT NUMBER: ITL82342
DATE: 07/31/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X4-37Y/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:
	Yokogawa WT210 Digital Power Meter #8	N/A
	Ocean Optics QE65000 Spectroradiometer	12/31/14
	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 (CRIa,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)

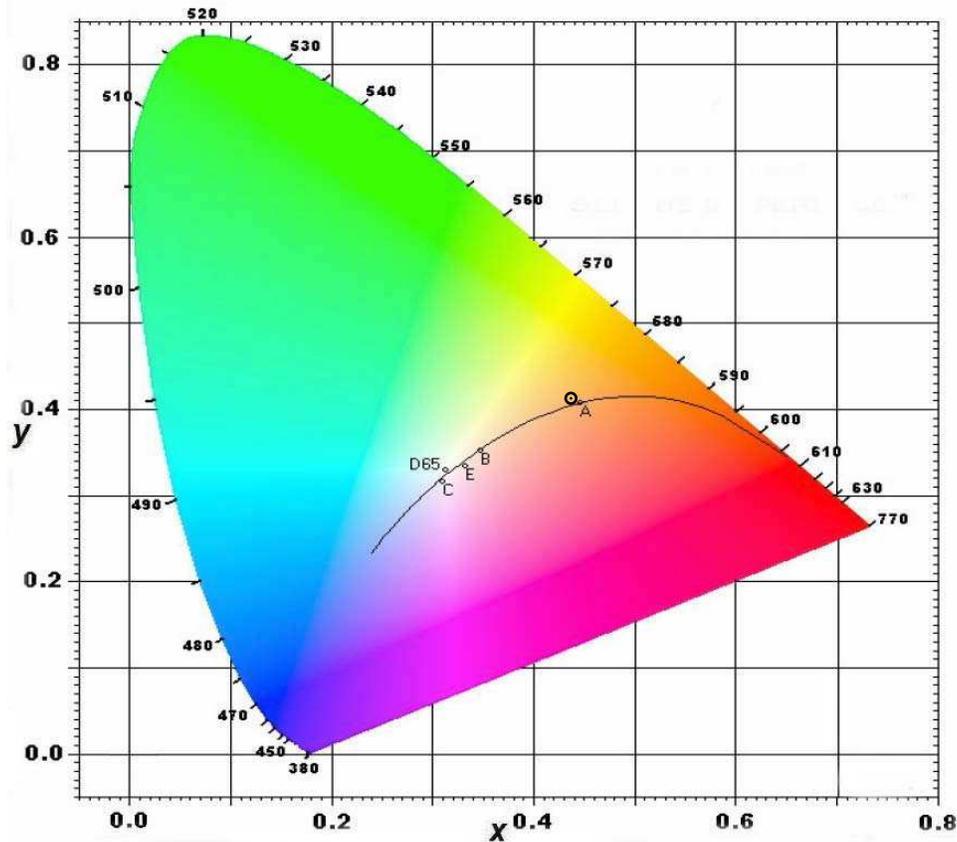
THIS ITL REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.

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



PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com
REPORT NUMBER: ITL82342
DATE: 07/31/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X4-37Y/D10

CIE Chromaticity Diagram





INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com
 REPORT NUMBER: ITL82342
 DATE: 07/31/14
 PREPARED FOR: RAB LIGHTING, INC.
 CATALOG NUMBER: TRLED2X4-37Y/D10

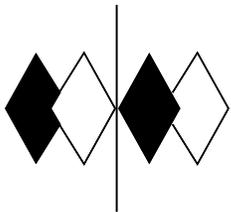
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4367
Chromaticity Ordinate y	0.4124
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2469
Chromaticity Ordinate v'	0.5246
Correlated Color Temp CCT (K)	3071
ANSI C78.377-2008 Duv	0.003
Total Radiant Flux (milliWatts)	10380 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.325
Input Power (Watts)	38.8
Input Power Factor (%)	99.5
Input Current THD (%)	9.9
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)	38.4
Input Power Factor (%)	94.3
Input Current THD (%)	13.1
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	81
R1 Light greyish red	79
R2 Dark greyish yellow	87
R3 Strong yellowish green	95
R4 Moderate yellowish green	80
R5 Light bluish green	78
R6 Light blue	83
R7 Light violet	87
R8 Light reddish purple	63
R9 Strong red	13
R10 Strong yellow	70
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.



PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com
 REPORT NUMBER: ITL82342
 DATE: 07/31/14
 PREPARED FOR: RAB LIGHTING, INC.
 CATALOG NUMBER: TRLED2X4-37Y/D10

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.242	515	28.744	650	43.243
385	0.231	520	31.283	655	40.042
390	0.239	525	33.488	660	36.882
395	0.254	530	35.557	665	33.722
400	0.289	535	37.572	670	30.697
405	0.374	540	39.688	675	27.741
410	0.563	545	41.976	680	24.951
415	0.943	550	44.395	685	22.355
420	1.677	555	46.883	690	19.969
425	3.020	560	49.519	695	17.780
430	5.343	565	52.018	700	15.709
435	8.907	570	54.353	705	13.835
440	14.434	575	56.444	710	12.129
445	23.580	580	58.351	715	10.578
450	32.418	585	59.997	720	9.211
455	31.023	590	61.298	725	8.006
460	22.723	595	62.204	730	6.957
465	17.685	600	62.631	735	6.026
470	14.455	605	62.522	740	5.235
475	11.557	610	61.912	745	4.528
480	10.464	615	60.723	750	3.920
485	11.137	620	59.081	755	3.393
490	12.885	625	57.034	760	2.930
495	15.640	630	54.693	765	2.526
500	19.061	635	52.104	770	2.180
505	22.592	640	49.289	775	1.878
510	25.837	645	46.336	780	1.625

