

REPORT NUMBER: ITL82331

PAGE: 1 OF 5

ISSUE DATE: 07/30/14

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: TRLED2X4-37YN/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 = 37.4 AT 120.0 VOLTS

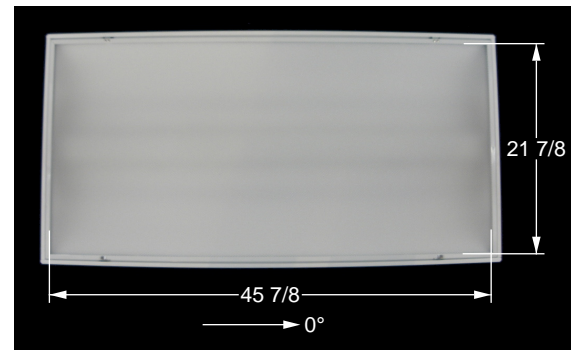
MOUNTING: RECESSED

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	1511	1511	1511	1511	1511	
5	1504	1506	1504	1502	1502	143
15	1430	1433	1431	1429	1430	403
25	1278	1283	1281	1281	1280	589
35	1061	1068	1066	1063	1061	664
45	805	809	806	800	799	620
55	549	551	545	535	534	487
65	339	336	328	325	329	331
75	197	193	189	192	197	204
85	73	69	73	75	77	77
90	0	0	0	0	0	

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	1135	32.2
0- 40	1799	51.1
0- 60	2906	82.6
0- 90	3519	100.0
90-180	0	0.0
0-180	3519	100.0

EFFICACY = 94.1 lm/W

CIE TYPE - DIRECT

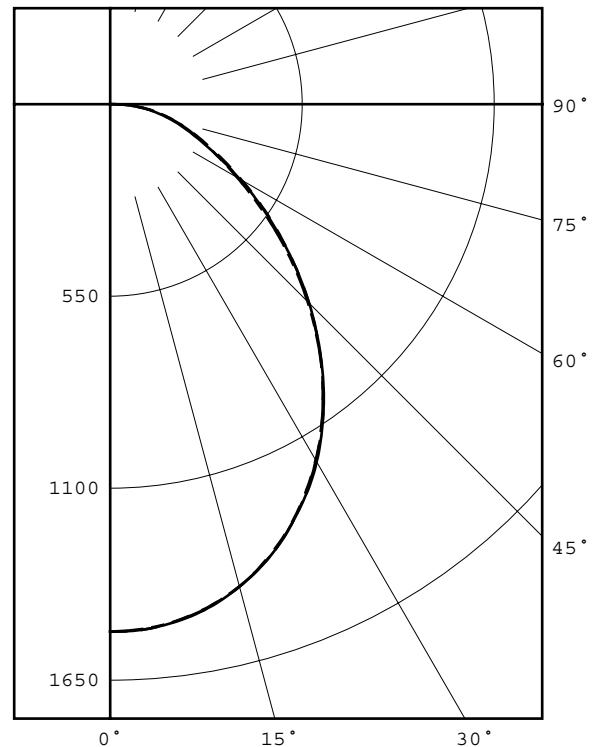
PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.17 1.17

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	1758.	1761.	1745.
55	1478.	1468.	1438.
65	1239.	1199.	1202.
75	1176.	1128.	1176.
85	1294.	1294.	1365.



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

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

REPORT NUMBER: ITL82331

PAGE: 2 OF 5

ISSUE DATE: 07/30/14

PREPARED FOR: RAB LIGHTING, INC.

CANDELA DISTRIBUTION
LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1511	1511	1511	1511	1511
2.5	1510	1511	1510	1508	1508
5.0	1504	1506	1504	1502	1502
7.5	1492	1495	1493	1490	1491
10.0	1475	1479	1478	1475	1476
12.5	1455	1459	1457	1455	1455
15.0	1430	1433	1431	1429	1430
17.5	1399	1403	1401	1400	1400
20.0	1363	1368	1366	1365	1366
22.5	1323	1327	1325	1324	1326
25.0	1278	1283	1281	1281	1280
27.5	1229	1234	1235	1232	1232
30.0	1177	1181	1183	1179	1178
32.5	1122	1127	1126	1123	1122
35.0	1061	1068	1066	1063	1061
37.5	999	1005	1003	1000	1000
40.0	936	940	938	935	934
42.5	870	875	872	867	867
45.0	805	809	806	800	799
47.5	739	742	739	732	731
50.0	673	677	672	665	663
52.5	610	614	607	599	598
55.0	549	551	545	535	534
57.5	491	491	486	474	475
60.0	435	435	428	419	420
62.5	385	383	376	369	372
65.0	339	336	328	325	329
67.5	298	295	287	287	292
70.0	263	257	250	253	258
72.5	229	224	219	222	227
75.0	197	193	189	192	197
77.5	166	162	160	164	168
80.0	136	132	132	135	140
82.5	106	101	104	105	110
85.0	73	69	73	75	77
87.5	36	36	39	41	41
90.0	0	0	0	0	0



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: ITL82331
ISSUE DATE: 07/30/14
PREPARED FOR: RAB LIGHTING, INC.

PAGE: 3 OF 5

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	36
5- 10	107
10- 15	173
15- 20	231
20- 25	278
25- 30	311
30- 35	331
35- 40	334
40- 45	322
45- 50	298
50- 55	263
55- 60	224
60- 65	184
65- 70	148
70- 75	117
75- 80	87
80- 85	57
85- 90	21

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	143
0- 20	546
0- 30	1135
0- 40	1799
0- 50	2419
0- 60	2906
0- 70	3237
0- 80	3442
0- 90	3519



REPORT NUMBER: ITL82331

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	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	68	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.



itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955



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

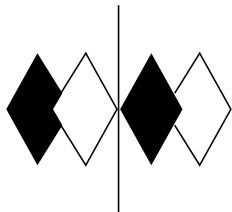
PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL82331
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.



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

Page 1 of 4

REPORT NUMBER: ITL82343
DATE: 07/31/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X4-37YN/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)

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



itl boulder

THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

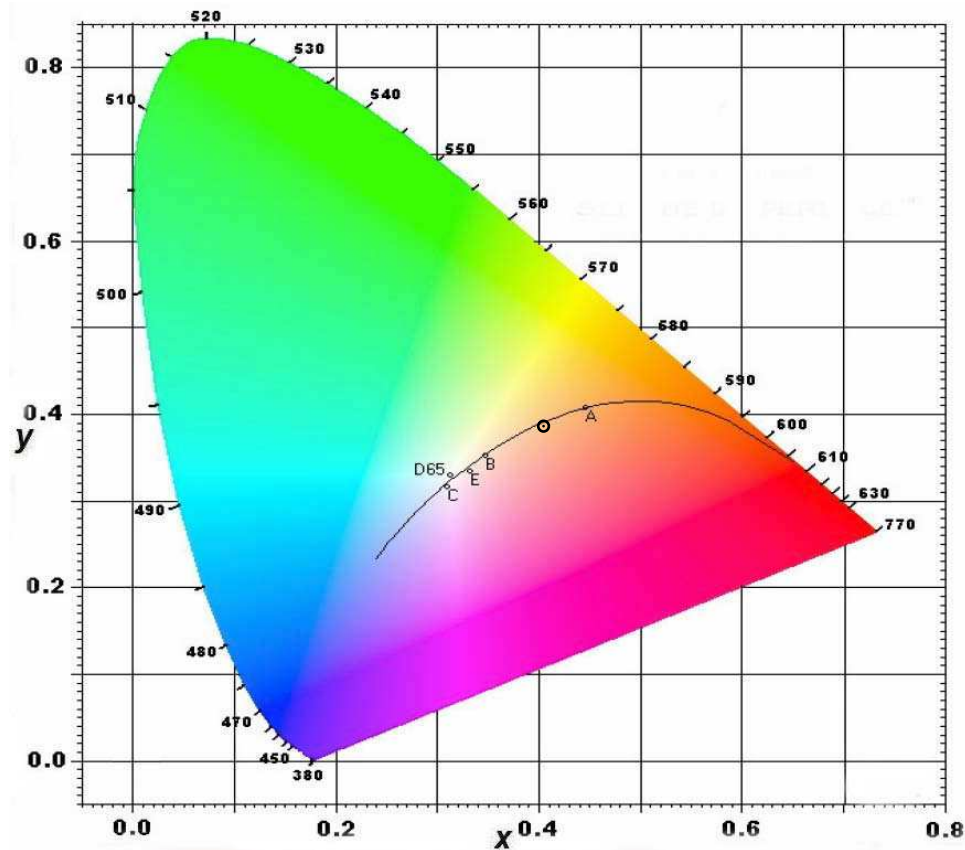
NVLAP
NVLAP LAB CODE: 200925-0

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: ITL82343
DATE: 07/31/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X4-37YN/D10

Page 4 of 4

CIE Chromaticity Diagram



PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com
 REPORT NUMBER: ITL82343
 DATE: 07/31/14
 PREPARED FOR: RAB LIGHTING, INC.
 CATALOG NUMBER: TRLED2X4-37YN/D10

Page 2 of 4

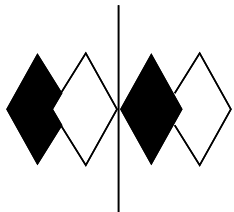
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4044
Chromaticity Ordinate y	0.3859
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2371
Chromaticity Ordinate v'	0.5091
Correlated Color Temp CCT (K)	3479
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	11349 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.314
Input Power (Watts)	37.4
Input Power Factor (%)	99.3
Input Current THD (%)	10.1
Input Voltage THD (%)	0.1
Off-State Power (Watts)	
	0.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.143
Input Power (Watts)	37.2
Input Power Factor (%)	93.9
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	94
R4 Moderate yellowish green	82
R5 Light bluish green	82
R6 Light blue	86
R7 Light violet	87
R8 Light reddish purple	70
R9 Strong red	28
R10 Strong yellow	76
R11 Strong green	79
R12 Strong blue	63
R13 Light yellowish pink (skin)	85
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.



itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

NVLAP
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: ITL82343
DATE: 07/31/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X4-37YN/D10

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.296	515	33.139	650	43.308
385	0.289	520	35.787	655	40.033
390	0.286	525	38.070	660	36.712
395	0.303	530	40.187	665	33.277
400	0.352	535	42.172	670	29.977
405	0.444	540	44.172	675	26.984
410	0.643	545	46.241	680	24.417
415	1.072	550	48.329	685	22.082
420	1.929	555	50.472	690	19.850
425	3.593	560	52.723	695	17.682
430	6.709	565	54.866	700	15.645
435	11.900	570	56.833	705	13.742
440	20.111	575	58.576	710	12.040
445	34.247	580	60.057	715	10.491
450	52.485	585	61.197	720	9.131
455	57.151	590	61.912	725	7.945
460	42.641	595	62.214	730	6.911
465	30.645	600	62.117	735	6.006
470	24.446	605	61.682	740	5.235
475	18.689	610	61.043	745	4.547
480	15.332	615	59.993	750	3.949
485	15.173	620	58.654	755	3.430
490	16.636	625	56.947	760	2.967
495	19.224	630	54.850	765	2.562
500	22.757	635	52.343	770	2.210
505	26.581	640	49.515	775	1.910
510	30.058	645	46.487	780	1.643

