

REPORT NUMBER: ITL80217

PAGE: 1 OF 5

ISSUE DATE: 12/19/13

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: PANEL2X2-41YN

LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 2 WHITE CIRCUIT BOARDS  
EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC DIFFUSER. DIFFUSER  
FROSTED SIDE UP.

LAMPS: TWO HUNDRED FORTY WHITE LIGHT EMITTING DIODES (LEDs), VERTICAL  
BASE-UP POSITION.

TOTAL INPUT WATTS = 39.5 AT 120.0 VOLTS

MOUNTING: RECESSED

LED DRIVER: RAB RD-052-A1050-R-080C

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE  
PROVIDED AT RATED INPUT VOLTAGE  
(120VAC, 60Hz) TO THE LED DRIVER.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 35.0 FEET

#### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	
0	1375	1375	1375	1375	1375	
5	1368	1369	1369	1369	1368	130
15	1309	1311	1311	1311	1310	370
25	1197	1197	1197	1197	1196	551
35	1036	1035	1035	1037	1035	648
45	845	846	846	847	844	652
55	638	640	639	639	642	572
65	426	428	429	428	430	424
75	218	220	220	219	221	233
85	43	42	43	43	43	54
90	0	0	0	0	0	

#### FLUX

#### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	1051	28.9
0- 40	1698	46.7
0- 60	2922	80.4
0- 90	3633	100.0
90-180	0	0.0
0-180	3633	100.0

EFFICACY = 92.0 lm/W

CIE TYPE - DIRECT

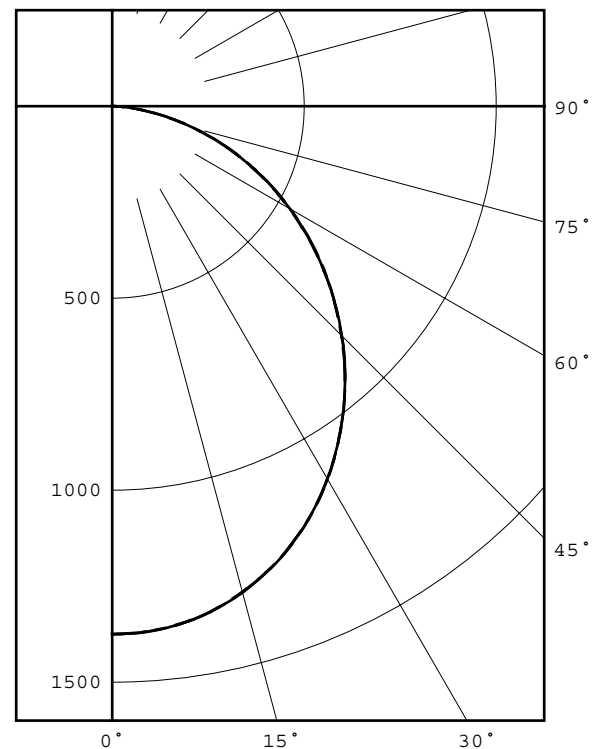
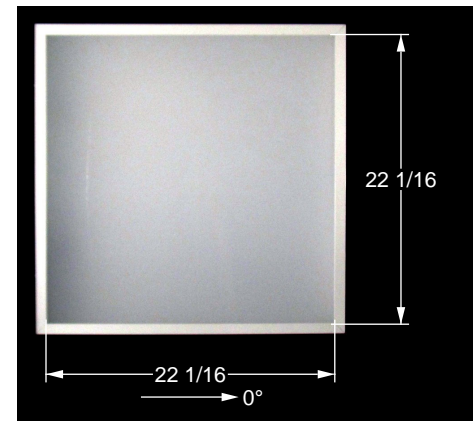
PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.21 1.21

LUMINOUS LENGTH : 22.063 22.063

#### LUMINANCE DATA IN CANDELA/SQ M

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	3805.	3810.	3801.
55	3542.	3548.	3564.
65	3210.	3232.	3240.
75	2682.	2707.	2719.
85	1571.	1571.	1571.



#### LEGEND:

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

Checked M KLOPF  
Approved R BEATTIE  
Lighting Engineer



INDEPENDENT TESTING LABORATORIES, INC.  
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# CANDELA DISTRIBUTION LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1375	1375	1375	1375	1375
2.5	1373	1374	1374	1374	1373
5.0	1368	1369	1369	1369	1368
7.5	1359	1360	1360	1360	1360
10.0	1347	1348	1348	1348	1347
12.5	1330	1331	1331	1331	1330
15.0	1309	1311	1311	1311	1310
17.5	1286	1287	1287	1287	1286
20.0	1260	1260	1261	1261	1260
22.5	1231	1230	1230	1230	1229
25.0	1197	1197	1197	1197	1196
27.5	1161	1160	1160	1161	1160
30.0	1122	1121	1121	1122	1120
32.5	1080	1079	1079	1081	1079
35.0	1036	1035	1035	1037	1035
37.5	991	989	990	991	990
40.0	943	943	943	944	943
42.5	895	894	896	896	894
45.0	845	846	846	847	844
47.5	794	794	795	795	793
50.0	743	743	744	744	744
52.5	690	691	691	692	694
55.0	638	640	639	639	642
57.5	585	587	587	587	589
60.0	532	534	534	534	536
62.5	479	481	482	481	483
65.0	426	428	429	428	430
67.5	373	375	375	374	377
70.0	321	323	323	322	325
72.5	269	271	271	270	273
75.0	218	220	220	219	221
77.5	169	170	171	171	172
80.0	123	123	124	125	125
82.5	81	80	80	81	81
85.0	43	42	43	43	43
87.5	15	15	15	15	15
90.0	0	0	0	0	0



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5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	33
5- 10	97
10- 15	158
15- 20	212
20- 25	258
25- 30	293
30- 35	318
35- 40	330
40- 45	331
45- 50	321
50- 55	301
55- 60	271
60- 65	234
65- 70	190
70- 75	142
75- 80	92
80- 85	44
85- 90	10

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	130
0- 20	500
0- 30	1051
0- 40	1698
0- 50	2350
0- 60	2922
0- 70	3346
0- 80	3579
0- 90	3633



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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	104	100	96	106	102	98	95	98	95	92	94	91	89	90	88	86	84
2	99	91	85	79	97	89	83	78	86	81	76	83	78	74	80	76	73	71
3	91	80	72	66	88	79	71	65	76	69	64	73	68	63	70	66	62	60
4	83	71	63	56	81	70	62	56	67	60	55	65	59	54	63	58	53	51
5	77	64	55	48	74	63	54	48	61	53	48	59	52	47	57	51	47	44
6	71	58	49	42	69	57	48	42	55	47	42	53	46	41	52	46	41	39
7	66	52	44	37	64	51	43	37	50	42	37	48	42	37	47	41	36	35
8	61	48	39	33	60	47	39	33	46	38	33	44	38	33	43	37	33	31
9	57	44	36	30	56	43	35	30	42	35	30	41	34	30	40	34	30	28
10	54	40	33	27	52	40	32	27	39	32	27	38	32	27	37	31	27	25

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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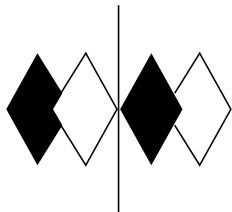
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ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

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DATE: 12/27/13  
PREPARED FOR: RAB LIGHTING, INC.  
CATALOG NUMBER: PANEL2X2-41YN

ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 2 WHITE CIRCUIT BOARDS EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC DIFFUSER. DIFFUSER FROSTED SIDE UP.

LAMP: TWO HUNDRED FORTY WHITE LIGHT EMITTING DIODES (LEDs), VERTICAL BASE-UP POSITION.

DRIVER: RAB RD-052-A1050-R-080C

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120.0 AND 277.0 VAC, 60Hz) TO THE LED DRIVER.

	Calibration Due:
INSTRUMENTS:	
Associated Power Technologies APT5010 AC Power Source	N/A
Yokogawa WT210 Digital Power Meter #6	10/31/14
Ocean Optics QE65000 Spectroradiometer	10/17/14
ITL 1.5m Diameter Integrating Sphere S15-2, 4PI Geometry	10/17/14

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.

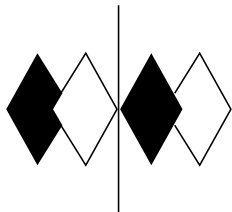
PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were 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	<u>N THOMAS</u>
Approved	<u>L GRABA</u>
	Lighting Engineer



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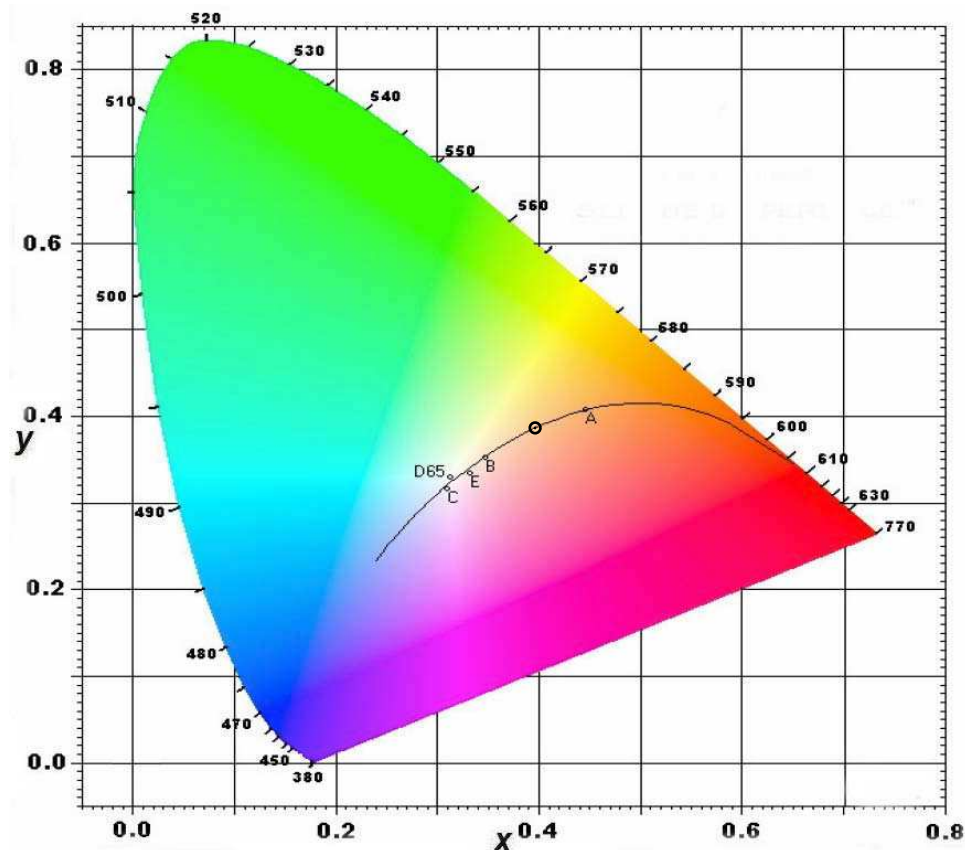
**NVLAP**  
NVLAP LAB CODE: 200925-0

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## CIE Chromaticity Diagram



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RESULTS:

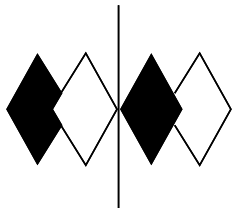
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3961
Chromaticity Ordinate y	0.3862
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2316
Chromaticity Ordinate v'	0.5080
Correlated Color Temp CCT (K)	3673
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	11745 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.331
Input Power (Watts)	39.5
Input Power Factor (%)	99.4
Input Current THD (%)	6.5
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)	0.157
Input Power (Watts)	40.3
Input Power Factor (%)	92.7
Input Current THD (%)	9.4
Input Voltage THD (%)	0.3

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	84
R1 Light greyish red	83
R2 Dark greyish yellow	89
R3 Strong yellowish green	92
R4 Moderate yellowish green	84
R5 Light bluish green	83
R6 Light blue	84
R7 Light violet	89
R8 Light reddish purple	72
R9 Strong red	29
R10 Strong yellow	73
R11 Strong green	82
R12 Strong blue	63
R13 Light yellowish pink (skin)	84
R14 Moderate olive green (leaf)	95

\*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	0.406	515	37.188	650	42.688
385	0.431	520	39.932	655	39.590
390	0.488	525	42.164	660	36.522
395	0.578	530	44.138	665	33.440
400	0.696	535	45.949	670	30.487
405	1.027	540	47.685	675	27.645
410	1.511	545	49.415	680	24.956
415	2.296	550	51.197	685	22.450
420	3.955	555	52.925	690	20.143
425	6.796	560	54.637	695	18.023
430	11.472	565	56.151	700	16.075
435	18.496	570	57.623	705	14.271
440	30.447	575	58.894	710	12.612
445	48.746	580	59.983	715	11.154
450	58.238	585	60.839	720	9.807
455	47.424	590	61.419	725	8.635
460	34.112	595	61.705	730	7.584
465	26.695	600	61.654	735	6.656
470	20.834	605	61.328	740	5.830
475	16.865	610	60.555	745	5.114
480	15.744	615	59.384	750	4.480
485	16.436	620	57.880	755	3.930
490	18.561	625	55.980	760	3.453
495	22.045	630	53.874	765	3.033
500	26.130	635	51.356	770	2.658
505	30.234	640	48.611	775	2.335
510	33.946	645	45.673	780	2.051

