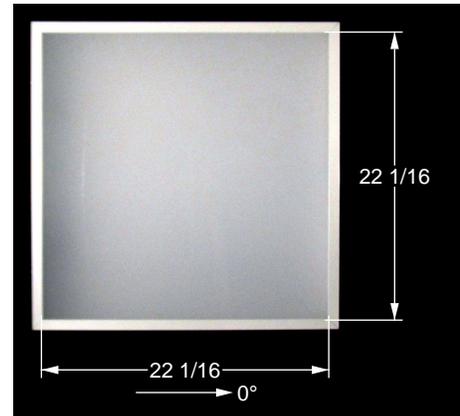


REPORT NUMBER: ITL80222
 ISSUE DATE: 12/20/13
 PREPARED FOR: RAB LIGHTING, INC.
 CATALOG NUMBER: PANEL2X2-52Y
 LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 2 WHITE CIRCUIT BOARDS EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC DIFFUSER. DIFFUSER FROSTED SIDE UP.
 LAMPS: TWO HUNDRED FORTY WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.
 TOTAL INPUT WATTS = 52.8 AT 120.0 VOLTS
 MOUNTING: RECESSED
 LED DRIVER: RAB RD-052-A1050-R
 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

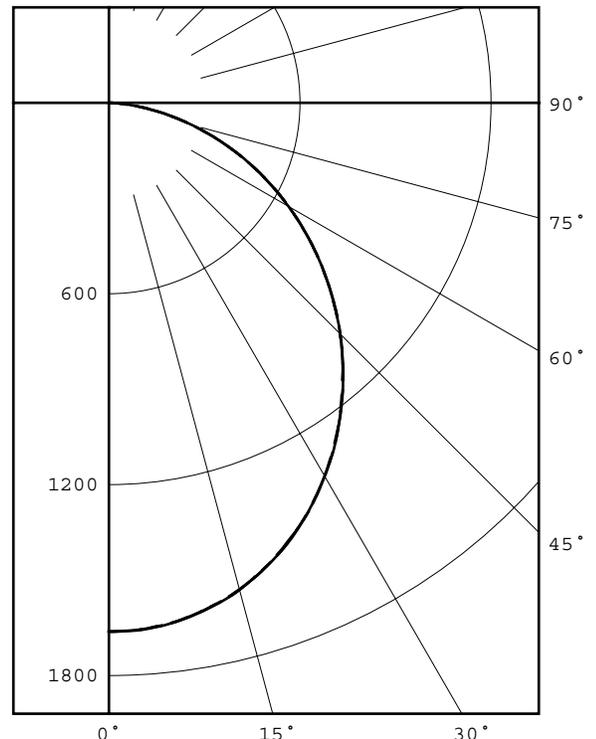
CANDELA DISTRIBUTION						FLUX
	0.0	22.5	45.0	67.5	90.0	
0	1662	1662	1662	1662	1662	157
5	1653	1654	1655	1654	1653	447
15	1584	1584	1585	1584	1583	666
25	1445	1445	1446	1446	1446	784
35	1252	1254	1254	1253	1254	791
45	1026	1026	1027	1026	1027	696
55	779	778	779	779	779	518
65	524	522	523	526	523	287
75	270	269	271	271	269	67
85	52	54	54	53	54	
90	0	0	0	0	0	



ZONAL LUMEN SUMMARY		
ZONE	LUMENS	% FIXT
0- 30	1269	28.8
0- 40	2053	46.5
0- 60	3541	80.2
0- 90	4413	100.0
90-180	0	0.0
0-180	4413	100.0

EFFICACY = 83.6 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	4620.	4625.	4625.	
55	4325.	4325.	4325.	
65	3948.	3941.	3941.	
75	3322.	3334.	3310.	
85	1900.	1973.	1973.	



LEGEND:
 0-deg - - - - -
 45-deg - - - - -
 90-deg - - - - -

Checked D. GOLUBSKI
 Approved R. BEATTIE
 Lighting Engineer



INDEPENDENT TESTING LABORATORIES, INC.
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REPORT NUMBER: ITL80222

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PREPARED FOR: RAB LIGHTING, INC.

CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	1662	1662	1662	1662	1662
2.5	1660	1661	1661	1661	1660
5.0	1653	1654	1655	1654	1653
7.5	1643	1644	1644	1644	1643
10.0	1627	1628	1628	1628	1626
12.5	1607	1609	1609	1609	1607
15.0	1584	1584	1585	1584	1583
17.5	1555	1555	1555	1556	1554
20.0	1523	1523	1523	1523	1521
22.5	1486	1485	1487	1486	1484
25.0	1445	1445	1446	1446	1446
27.5	1401	1403	1402	1402	1402
30.0	1354	1356	1355	1355	1355
32.5	1304	1306	1307	1305	1306
35.0	1252	1254	1254	1253	1254
37.5	1197	1199	1200	1200	1199
40.0	1140	1143	1144	1143	1144
42.5	1086	1085	1086	1085	1086
45.0	1026	1026	1027	1026	1027
47.5	965	965	966	965	967
50.0	904	904	904	904	905
52.5	842	841	842	842	842
55.0	779	778	779	779	779
57.5	716	714	715	718	716
60.0	652	651	651	654	652
62.5	588	586	586	589	587
65.0	524	522	523	526	523
67.5	460	458	460	461	459
70.0	396	396	396	397	395
72.5	332	332	334	334	331
75.0	270	269	271	271	269
77.5	209	209	211	210	211
80.0	151	151	153	152	154
82.5	97	99	100	98	100
85.0	52	54	54	53	54
87.5	19	20	20	19	20
90.0	0	0	0	0	0



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	40
5- 10	117
10- 15	191
15- 20	256
20- 25	311
25- 30	354
30- 35	384
35- 40	400
40- 45	402
45- 50	390
50- 55	366
55- 60	331
60- 65	285
65- 70	233
70- 75	174
75- 80	113
80- 85	55
85- 90	13

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	157
0- 20	604
0- 30	1269
0- 40	2053
0- 50	2845
0- 60	3541
0- 70	4059
0- 80	4346
0- 90	4413



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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	119	116	116	116	116	111	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	84	84
2	99	91	84	79	97	89	83	78	86	81	76	82	78	74	79	76	73	71	71	71
3	91	80	72	66	88	79	71	65	76	69	64	73	67	63	70	66	62	60	60	60
4	83	71	62	56	81	70	62	55	67	60	55	65	59	54	63	58	53	51	51	51
5	76	64	55	48	74	63	54	48	60	53	47	58	52	47	57	51	46	44	44	44
6	71	57	49	42	69	56	48	42	55	47	42	53	46	41	51	46	41	39	39	39
7	66	52	43	37	64	51	43	37	50	42	37	48	42	37	47	41	36	34	34	34
8	61	48	39	33	59	47	39	33	46	38	33	44	38	33	43	37	33	31	31	31
9	57	44	36	30	56	43	35	30	42	35	30	41	34	30	40	34	30	28	28	28
10	54	40	33	27	52	40	32	27	39	32	27	38	32	27	37	31	27	25	25	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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NVLAP LAB CODE: 200925-0

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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.



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Page 1 of 4

REPORT NUMBER: ITL80225
DATE: 12/27/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: PANEL2X2-52Y

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

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

INSTRUMENTS: Associated Power Technologies APT5010 AC Power Source Calibration Due: 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 (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)

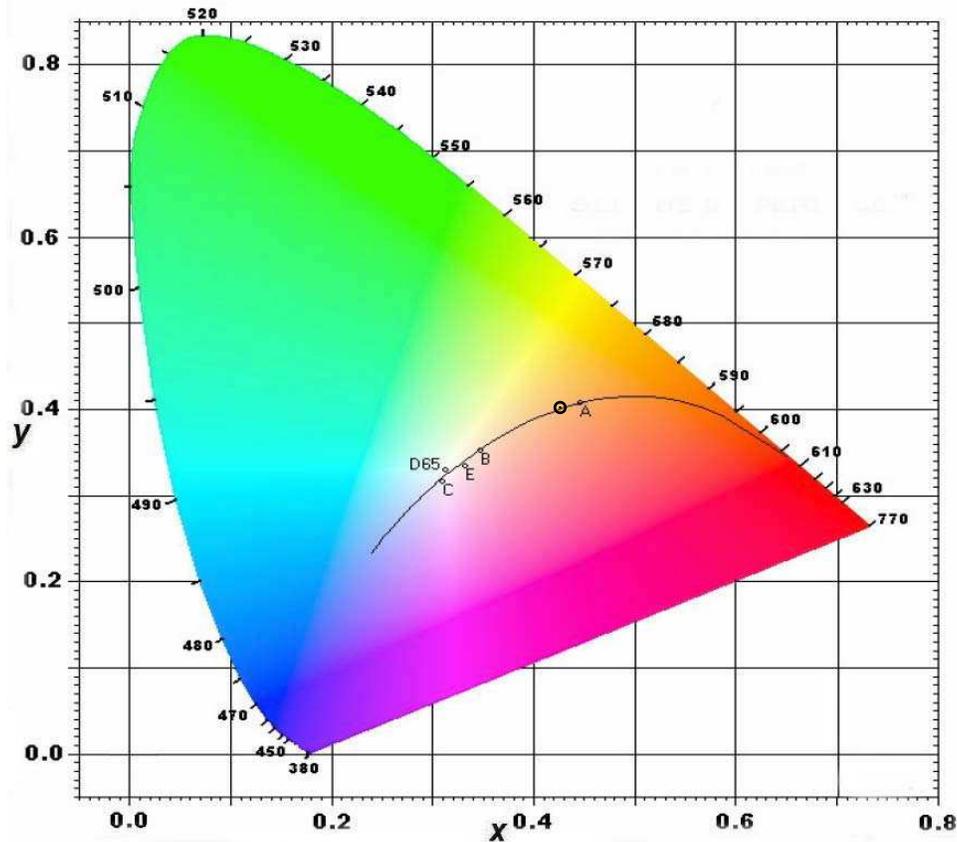
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Checked N THOMAS
Approved L GRABA
Lighting Engineer



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CIE Chromaticity Diagram





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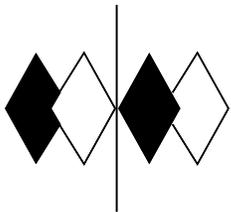
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4260
Chromaticity Ordinate y	0.4017
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2445
Chromaticity Ordinate v'	0.5188
Correlated Color Temp CCT (K)	3173
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	14280 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.444
Input Power (Watts)	52.9
Input Power Factor (%)	99.3
Input Current THD (%)	7.0
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)	0.199
Input Power (Watts)	52.8
Input Power Factor (%)	95.8
Input Current THD (%)	7.2
Input Voltage THD (%)	0.3

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	81
R2 Dark greyish yellow	87
R3 Strong yellowish green	93
R4 Moderate yellowish green	83
R5 Light bluish green	81
R6 Light blue	83
R7 Light violet	87
R8 Light reddish purple	68
R9 Strong red	23
R10 Strong yellow	71
R11 Strong green	81
R12 Strong blue	65
R13 Light yellowish pink (skin)	82
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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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.468	515	40.129	650	58.838
385	0.499	520	43.568	655	54.709
390	0.566	525	46.483	660	50.602
395	0.671	530	49.208	665	46.488
400	0.813	535	51.808	670	42.483
405	1.167	540	54.377	675	38.617
410	1.776	545	57.035	680	34.909
415	2.812	550	59.849	685	31.424
420	4.892	555	62.673	690	28.233
425	8.432	560	65.506	695	25.284
430	13.877	565	68.211	700	22.567
435	21.797	570	70.904	705	20.051
440	34.694	575	73.374	710	17.753
445	49.383	580	75.679	715	15.708
450	49.544	585	77.659	720	13.849
455	36.418	590	79.294	725	12.186
460	26.534	595	80.405	730	10.711
465	20.722	600	81.020	735	9.389
470	16.140	605	81.203	740	8.241
475	13.827	610	80.727	745	7.225
480	13.748	615	79.675	750	6.340
485	15.155	620	78.057	755	5.566
490	18.086	625	75.924	760	4.894
495	22.317	630	73.303	765	4.305
500	27.045	635	70.117	770	3.775
505	31.816	640	66.626	775	3.315
510	36.217	645	62.844	780	2.910

