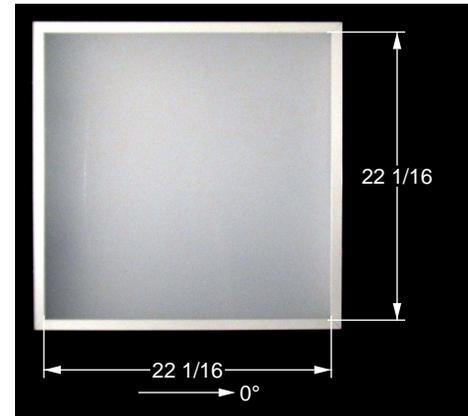


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REPORT NUMBER: ITL80223 PAGE: 1 OF 5
 ISSUE DATE: 12/18/13
 PREPARED FOR: RAB LIGHTING, INC.
 CATALOG NUMBER: PANEL2X2-52YN
 LUMINAIRE: FABRICATED WHITE PAINTED METAL HOUSING, 2 WHITE CIRCUIT BOARDS
 EACH WITH 120 LEDS, FROSTED HOLOGRAPHIC PLASTIC DIFFUSER. DIFFUSER
 FROSTED SIDE UP.
 LAMPS: TWO HUNDRED FORTY WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL
 BASE-UP POSITION.
 TOTAL INPUT WATTS = 53.1 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

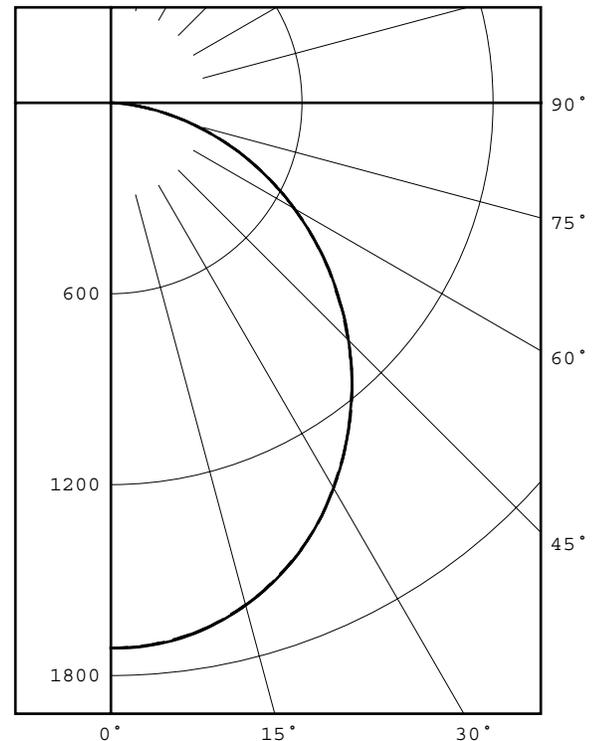


CANDELA DISTRIBUTION						FLUX
	0.0	22.5	45.0	67.5	90.0	
0	1714	1714	1714	1714	1714	
5	1705	1707	1707	1706	1705	162
15	1633	1635	1635	1635	1634	461
25	1493	1491	1493	1493	1493	687
35	1292	1292	1291	1292	1291	808
45	1052	1054	1055	1054	1055	813
55	796	796	798	797	798	712
65	532	532	532	532	533	527
75	273	272	274	274	274	290
85	53	53	54	54	54	68
90	0	0	0	0	0	

ZONAL LUMEN SUMMARY		
ZONE	LUMENS	%FIXT
0- 30	1310	28.9
0- 40	2118	46.8
0- 60	3644	80.5
0- 90	4529	100.0
90-180	0	0.0
0-180	4529	100.0

EFFICACY = 85.3 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	4738.	4751.	4751.
55	4419.	4430.	4430.
65	4009.	4009.	4016.
75	3359.	3371.	3371.
85	1936.	1973.	1973.



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

Checked MKLOPF
 Approved R.BEATTIE
 Lighting Engineer



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REPORT NUMBER: ITL80223

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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	1714	1714	1714	1714	1714
2.5	1711	1713	1713	1713	1712
5.0	1705	1707	1707	1706	1705
7.5	1694	1696	1697	1696	1695
10.0	1679	1680	1681	1679	1679
12.5	1658	1660	1660	1660	1659
15.0	1633	1635	1635	1635	1634
17.5	1604	1605	1606	1605	1604
20.0	1570	1572	1572	1572	1571
22.5	1533	1534	1535	1536	1535
25.0	1493	1491	1493	1493	1493
27.5	1448	1447	1448	1449	1448
30.0	1398	1398	1398	1400	1396
32.5	1347	1345	1346	1348	1345
35.0	1292	1292	1291	1292	1291
37.5	1236	1235	1234	1236	1236
40.0	1177	1176	1177	1177	1177
42.5	1117	1116	1117	1117	1117
45.0	1052	1054	1055	1054	1055
47.5	989	993	992	991	992
50.0	924	927	927	926	927
52.5	862	862	864	863	863
55.0	796	796	798	797	798
57.5	730	730	731	731	732
60.0	664	664	665	665	666
62.5	598	598	599	599	600
65.0	532	532	532	532	533
67.5	467	467	468	467	468
70.0	402	401	402	402	403
72.5	337	337	337	338	338
75.0	273	272	274	274	274
77.5	211	212	213	213	212
80.0	153	154	154	154	153
82.5	99	100	101	100	99
85.0	53	53	54	54	54
87.5	18	19	19	19	19
90.0	0	0	0	0	0



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	41
5- 10	121
10- 15	197
15- 20	264
20- 25	321
25- 30	366
30- 35	396
35- 40	412
40- 45	413
45- 50	400
50- 55	375
55- 60	338
60- 65	291
65- 70	236
70- 75	176
75- 80	114
80- 85	55
85- 90	13

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	162
0- 20	623
0- 30	1310
0- 40	2118
0- 50	2931
0- 60	3644
0- 70	4171
0- 80	4461
0- 90	4529



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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	104	100	96	106	102	98	95	98	95	92	94	91	89	90	88	86	84	90	88	86	84
2	99	91	85	79	97	89	83	78	86	81	76	83	78	74	80	76	73	71	80	76	73	71
3	91	80	72	66	88	79	71	65	76	69	64	73	68	63	70	66	62	60	70	66	62	60
4	83	71	63	56	81	70	62	56	67	60	55	65	59	54	63	58	53	51	63	58	53	51
5	77	64	55	48	74	63	54	48	61	53	48	59	52	47	57	51	47	44	57	51	47	44
6	71	58	49	42	69	57	48	42	55	47	42	53	46	41	52	46	41	39	52	46	41	39
7	66	52	44	37	64	51	43	37	50	42	37	48	42	37	47	41	37	35	47	41	37	35
8	61	48	39	33	60	47	39	33	46	38	33	44	38	33	43	37	33	31	43	37	33	31
9	57	44	36	30	56	43	35	30	42	35	30	41	34	30	40	34	30	28	40	34	30	28
10	54	40	33	27	52	40	32	27	39	32	27	38	32	27	37	31	27	25	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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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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REPORT NUMBER: ITL80226
DATE: 12/27/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: PANEL2X2-52YN

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.

		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 (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)

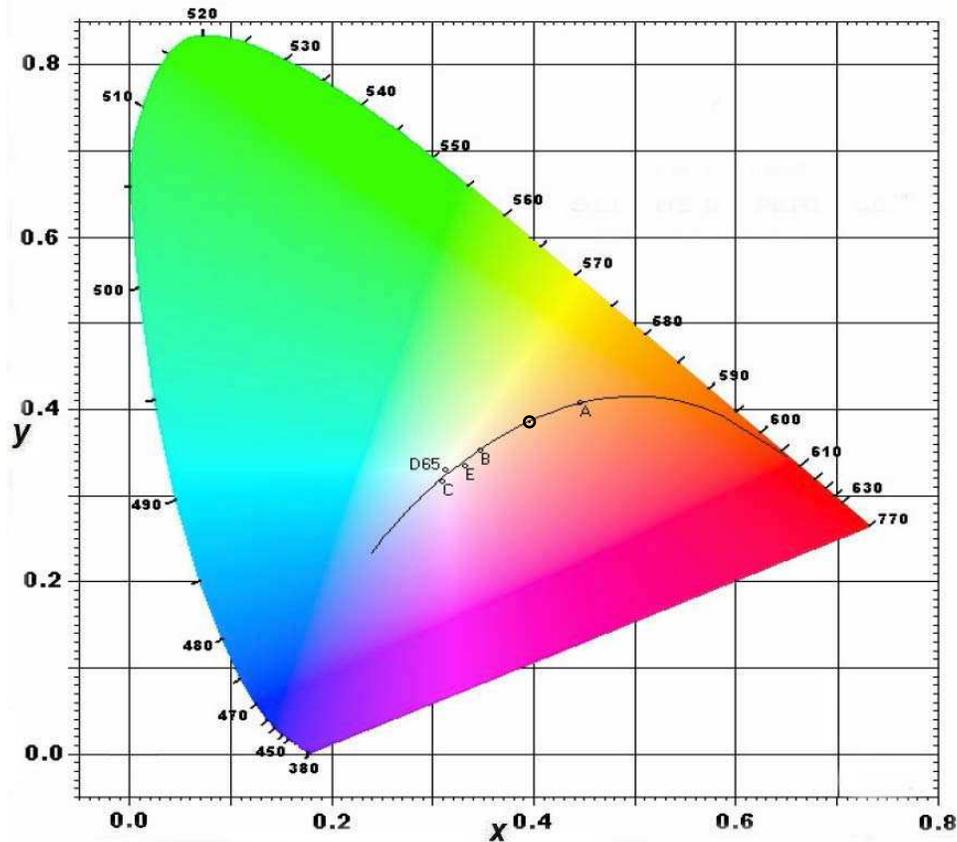
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Checked	<u>N THOMAS</u>
Approved	<u>L GRABA</u> Lighting Engineer



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CIE Chromaticity Diagram





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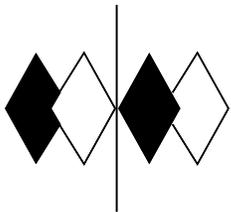
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3956
Chromaticity Ordinate y	0.3851
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2316
Chromaticity Ordinate v'	0.5075
Correlated Color Temp CCT (K)	3678
ANSI C78.377-2008 Duv	0.000
Total Radiant Flux (milliWatts)	14675 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.446
Input Power (Watts)	53.2
Input Power Factor (%)	99.4
Input Current THD (%)	7.2
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)	0.200
Input Power (Watts)	53.1
Input Power Factor (%)	95.8
Input Current THD (%)	7.1
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	64
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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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.514	515	46.169	650	53.166
385	0.552	520	49.613	655	49.337
390	0.623	525	52.437	660	45.534
395	0.732	530	54.926	665	41.696
400	0.892	535	57.221	670	38.027
405	1.330	540	59.405	675	34.491
410	1.965	545	61.578	680	31.125
415	3.059	550	63.818	685	28.047
420	5.269	555	66.014	690	25.181
425	9.026	560	68.165	695	22.549
430	15.134	565	70.051	700	20.120
435	24.098	570	71.910	705	17.875
440	38.678	575	73.501	710	15.827
445	60.565	580	74.863	715	13.995
450	72.322	585	75.929	720	12.329
455	59.653	590	76.643	725	10.858
460	43.162	595	76.984	730	9.531
465	33.690	600	76.893	735	8.363
470	26.340	605	76.417	740	7.336
475	21.341	610	75.466	745	6.436
480	19.836	615	74.039	750	5.647
485	20.630	620	72.164	755	4.956
490	23.194	625	69.827	760	4.357
495	27.456	630	67.088	765	3.830
500	32.456	635	63.945	770	3.357
505	37.512	640	60.538	775	2.951
510	42.138	645	56.923	780	2.597

