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THE LIGHT CENTER OF THE INDUSTRY SINCE 1955



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

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REPORT NUMBER: ITL82340
DATE: 07/30/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X2-50YN/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-050W-450G, 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



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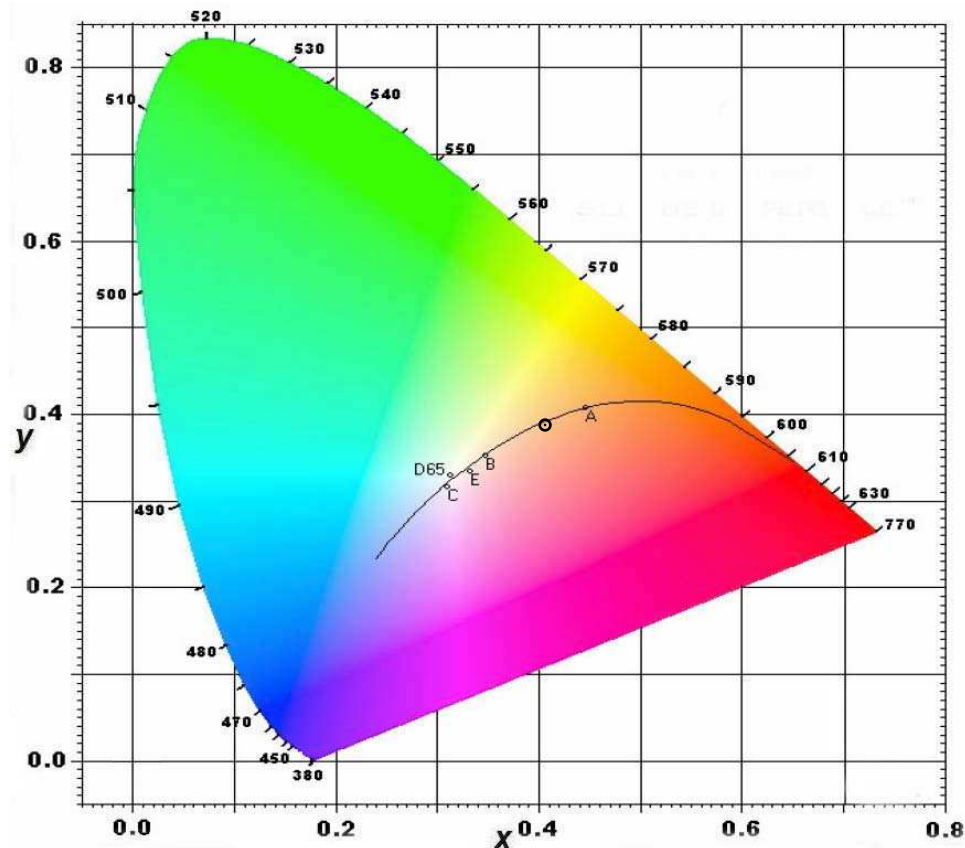
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CIE Chromaticity Diagram



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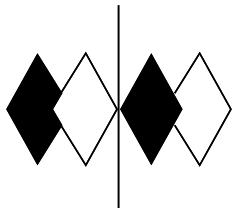
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4059
Chromaticity Ordinate y	0.3872
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2376
Chromaticity Ordinate v'	0.5099
Correlated Color Temp CCT (K)	3457
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	13530 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.429
Input Power (Watts)	51.1
Input Power Factor (%)	99.3
Input Current THD (%)	10.9
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)	0.199
Input Power (Watts)	50.1
Input Power Factor (%)	90.9
Input Current THD (%)	14.4
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	95
R4 Moderate yellowish green	82
R5 Light bluish green	82
R6 Light blue	86
R7 Light violet	87
R8 Light reddish purple	69
R9 Strong red	26
R10 Strong yellow	76
R11 Strong green	79
R12 Strong blue	63
R13 Light yellowish pink (skin)	84
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.



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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.313	515	39.285	650	51.600
385	0.300	520	42.449	655	47.726
390	0.319	525	45.211	660	43.750
395	0.329	530	47.835	665	39.652
400	0.390	535	50.222	670	35.714
405	0.523	540	52.671	675	32.144
410	0.796	545	55.260	680	29.016
415	1.369	550	57.847	685	26.186
420	2.485	555	60.461	690	23.489
425	4.597	560	63.107	695	20.916
430	8.439	565	65.661	700	18.494
435	14.658	570	68.029	705	16.255
440	24.073	575	70.163	710	14.225
445	39.542	580	71.996	715	12.410
450	59.402	585	73.467	720	10.803
455	65.746	590	74.412	725	9.408
460	50.761	595	74.823	730	8.182
465	36.743	600	74.753	735	7.108
470	29.231	605	74.164	740	6.191
475	22.692	610	73.248	745	5.374
480	18.661	615	72.130	750	4.663
485	18.269	620	70.401	755	4.042
490	19.918	625	68.175	760	3.488
495	22.933	630	65.527	765	3.018
500	26.990	635	62.498	770	2.610
505	31.446	640	59.038	775	2.252
510	35.598	645	55.427	780	1.943

