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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: ITL82347
DATE: 07/30/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X4-50N/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.

	Calibration Due:
INSTRUMENTS:	
Associated Power Technologies APT5040 AC Power Source	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)

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Checked	<i>N THOMAS</i>
Approved	<i>P O'CONNOR</i> Sphere Lab Supervisor



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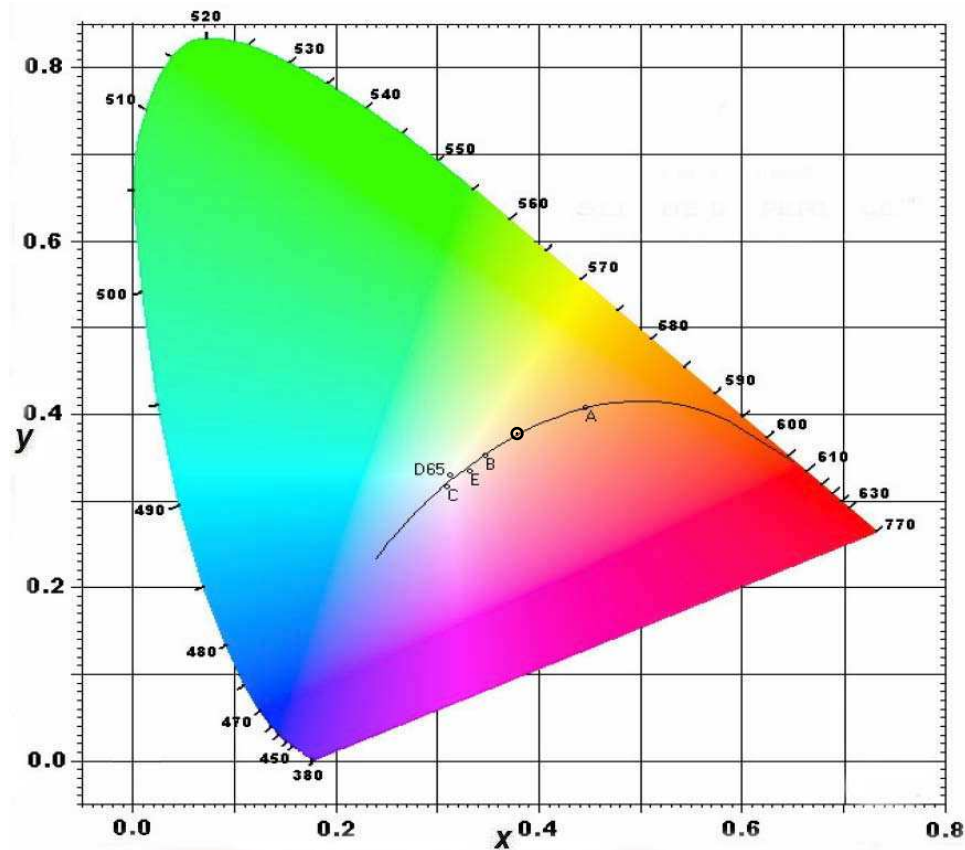
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CIE Chromaticity Diagram



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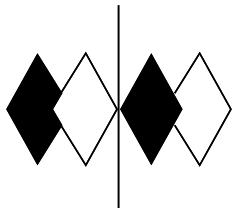
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3783
Chromaticity Ordinate y	0.3774
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2235
Chromaticity Ordinate v'	0.5016
Correlated Color Temp CCT (K)	4062
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	13402 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.417
Input Power (Watts)	49.6
Input Power Factor (%)	99.1
Input Current THD (%)	10.9
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)	0.195
Input Power (Watts)	48.8
Input Power Factor (%)	90.3
Input Current THD (%)	13.9
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	81
R2 Dark greyish yellow	88
R3 Strong yellowish green	93
R4 Moderate yellowish green	81
R5 Light bluish green	81
R6 Light blue	83
R7 Light violet	88
R8 Light reddish purple	70
R9 Strong red	21
R10 Strong yellow	72
R11 Strong green	79
R12 Strong blue	57
R13 Light yellowish pink (skin)	83
R14 Moderate olive green (leaf)	96

*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	0.372	515	44.844	650	43.116
385	0.369	520	48.108	655	39.819
390	0.391	525	50.791	660	36.583
395	0.421	530	53.152	665	33.432
400	0.480	535	55.217	670	30.441
405	0.639	540	57.296	675	27.476
410	0.953	545	59.343	680	24.636
415	1.633	550	61.362	685	21.977
420	2.944	555	63.336	690	19.552
425	5.494	560	65.251	695	17.308
430	10.221	565	66.837	700	15.279
435	18.086	570	68.068	705	13.429
440	30.235	575	68.937	710	11.786
445	50.164	580	69.541	715	10.266
450	74.892	585	69.881	720	8.946
455	81.374	590	69.878	725	7.787
460	61.358	595	69.529	730	6.771
465	43.659	600	68.813	735	5.888
470	34.219	605	67.661	740	5.118
475	26.146	610	66.080	745	4.439
480	21.339	615	64.013	750	3.854
485	20.949	620	61.546	755	3.337
490	22.924	625	58.806	760	2.889
495	26.469	630	55.898	765	2.494
500	31.221	635	52.861	770	2.149
505	36.309	640	49.700	775	1.863
510	40.891	645	46.472	780	1.608

