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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: ITL82338
DATE: 07/30/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X2-37N/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-037W-350G, 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)

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



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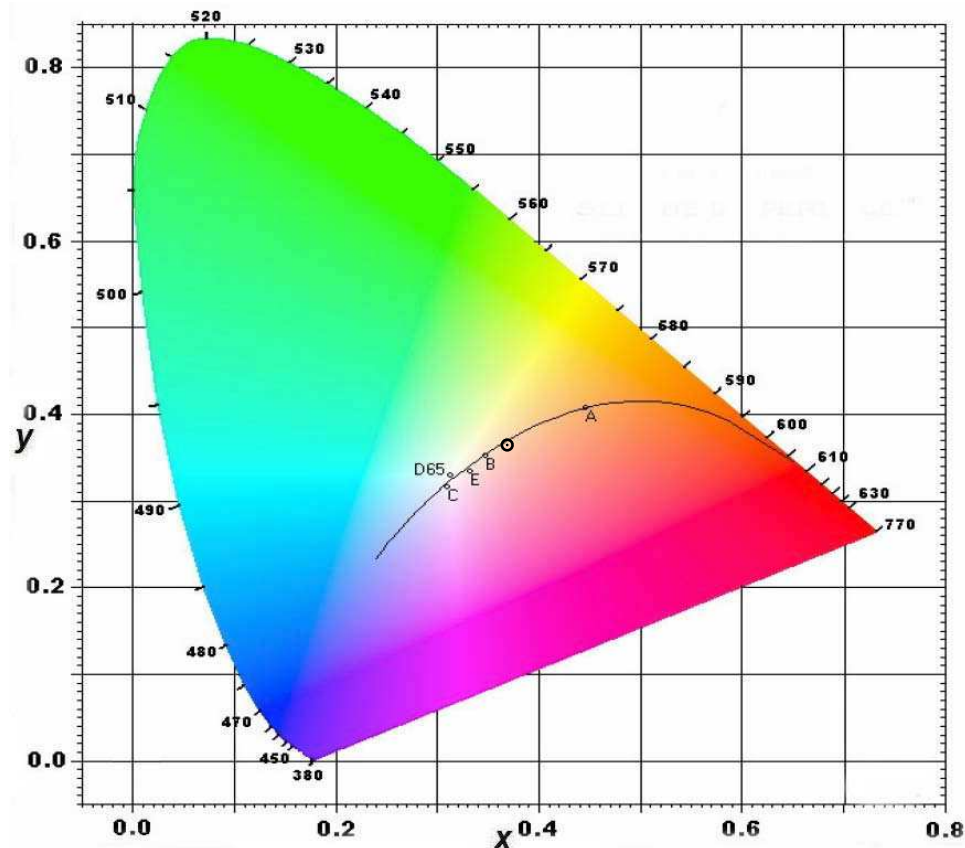
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CIE Chromaticity Diagram



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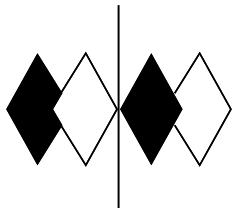
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3686
Chromaticity Ordinate y	0.3642
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2223
Chromaticity Ordinate v'	0.4942
Correlated Color Temp CCT (K)	4254
ANSI C78.377-2008 Duv	-0.002
Total Radiant Flux (milliWatts)	10838 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.318
Input Power (Watts)	37.9
Input Power Factor (%)	99.3
Input Current THD (%)	10.3
Input Voltage THD (%)	0.3
Off-State Power (Watts)	
	0.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.145
Input Power (Watts)	37.7
Input Power Factor (%)	93.9
Input Current THD (%)	12.8
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	83
R1 Light greyish red	82
R2 Dark greyish yellow	88
R3 Strong yellowish green	90
R4 Moderate yellowish green	83
R5 Light bluish green	82
R6 Light blue	82
R7 Light violet	88
R8 Light reddish purple	72
R9 Strong red	25
R10 Strong yellow	69
R11 Strong green	80
R12 Strong blue	57
R13 Light yellowish pink (skin)	83
R14 Moderate olive green (leaf)	94

*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	0.305	515	36.436	650	33.683
385	0.283	520	39.041	655	31.052
390	0.311	525	41.149	660	28.489
395	0.355	530	42.994	665	25.968
400	0.438	535	44.584	670	23.542
405	0.628	540	46.131	675	21.193
410	1.005	545	47.734	680	19.008
415	1.772	550	49.275	685	16.962
420	3.310	555	50.701	690	15.065
425	6.344	560	52.023	695	13.344
430	11.902	565	53.163	700	11.781
435	20.872	570	54.038	705	10.341
440	35.247	575	54.672	710	9.069
445	58.394	580	55.035	715	7.906
450	76.929	585	55.203	720	6.876
455	66.893	590	55.084	725	5.972
460	44.596	595	54.684	730	5.186
465	32.459	600	54.007	735	4.491
470	24.147	605	53.013	740	3.893
475	17.611	610	51.681	745	3.369
480	15.153	615	50.094	750	2.918
485	15.520	620	48.202	755	2.526
490	17.425	625	46.067	760	2.185
495	20.824	630	43.800	765	1.883
500	25.100	635	41.439	770	1.620
505	29.417	640	38.909	775	1.402
510	33.192	645	36.319	780	1.210

