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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: ITL82344
DATE: 07/31/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X4-37N/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)

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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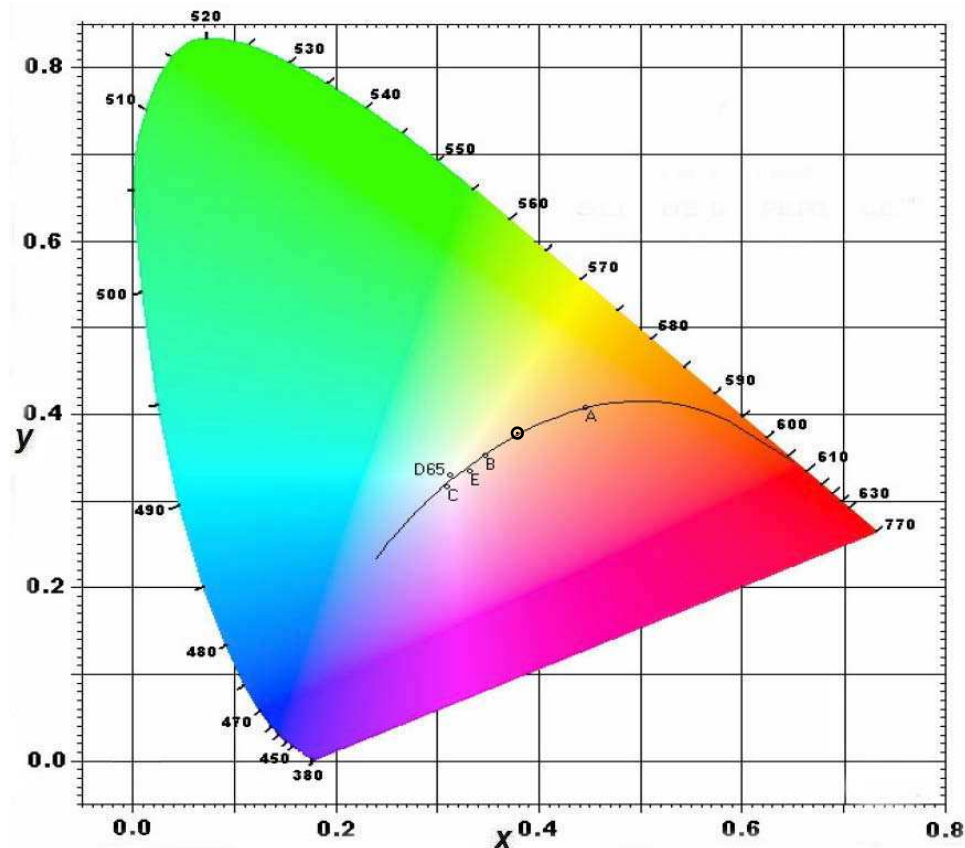
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NVLAP LAB CODE: 200925-0

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CIE Chromaticity Diagram



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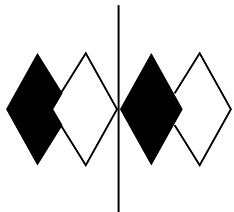
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3786
Chromaticity Ordinate y	0.3779
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2235
Chromaticity Ordinate v'	0.5018
Correlated Color Temp CCT (K)	4057
ANSI C78.377-2008 Duv	0.001
Total Radiant Flux (milliWatts)	10918 *
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 (%)	10.4
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 (%)	12.5
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	56
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	0.303	515	36.650	650	35.245
385	0.297	520	39.312	655	32.499
390	0.311	525	41.459	660	29.890
395	0.332	530	43.358	665	27.323
400	0.384	535	45.027	670	24.830
405	0.506	540	46.676	675	22.410
410	0.743	545	48.355	680	20.109
415	1.240	550	49.997	685	17.936
420	2.222	555	51.600	690	15.935
425	4.157	560	53.165	695	14.109
430	7.811	565	54.450	700	12.455
435	13.992	570	55.446	705	10.940
440	23.786	575	56.157	710	9.583
445	40.539	580	56.652	715	8.357
450	61.861	585	56.949	720	7.275
455	67.158	590	56.943	725	6.333
460	49.868	595	56.678	730	5.498
465	35.370	600	56.107	735	4.776
470	27.812	605	55.182	740	4.151
475	21.129	610	53.916	745	3.601
480	17.221	615	52.215	750	3.124
485	16.984	620	50.203	755	2.709
490	18.648	625	48.017	760	2.342
495	21.580	630	45.643	765	2.016
500	25.506	635	43.185	770	1.741
505	29.692	640	40.611	775	1.507
510	33.454	645	37.961	780	1.302

