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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: ITL82345
DATE: 07/30/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X4-50Y/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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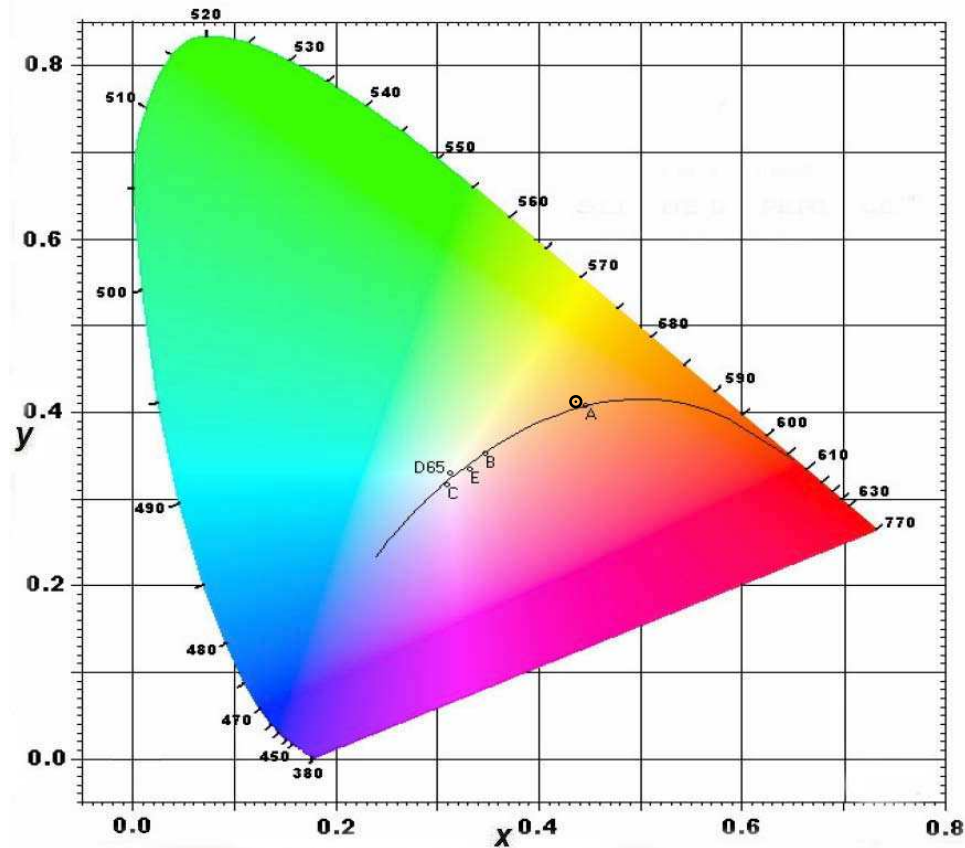
NVLAP LAB CODE: 200925-0

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CIE Chromaticity Diagram



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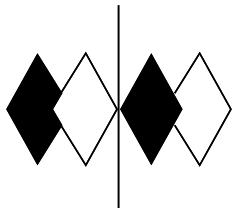
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4362
Chromaticity Ordinate y	0.4118
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2468
Chromaticity Ordinate v'	0.5243
Correlated Color Temp CCT (K)	3074
ANSI C78.377-2008 Duv	0.003
Total Radiant Flux (milliWatts)	12662 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.424
Input Power (Watts)	50.5
Input Power Factor (%)	99.3
Input Current THD (%)	11.0
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)	0.197
Input Power (Watts)	49.6
Input Power Factor (%)	90.9
Input Current THD (%)	14.4
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	81
R1 Light greyish red	79
R2 Dark greyish yellow	87
R3 Strong yellowish green	95
R4 Moderate yellowish green	79
R5 Light bluish green	78
R6 Light blue	83
R7 Light violet	86
R8 Light reddish purple	63
R9 Strong red	13
R10 Strong yellow	70
R11 Strong green	76
R12 Strong blue	60
R13 Light yellowish pink (skin)	80
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	0.295	515	34.926	650	52.570
385	0.303	520	38.032	655	48.710
390	0.307	525	40.736	660	44.852
395	0.325	530	43.307	665	41.017
400	0.370	535	45.797	670	37.350
405	0.490	540	48.397	675	33.789
410	0.742	545	51.174	680	30.400
415	1.250	550	54.137	685	27.239
420	2.218	555	57.207	690	24.332
425	3.972	560	60.390	695	21.669
430	6.925	565	63.446	700	19.175
435	11.415	570	66.303	705	16.870
440	18.131	575	68.842	710	14.815
445	28.856	580	71.158	715	12.928
450	39.141	585	73.185	720	11.263
455	37.732	590	74.739	725	9.792
460	27.998	595	75.798	730	8.508
465	21.727	600	76.296	735	7.386
470	17.777	605	76.167	740	6.418
475	14.285	610	75.442	745	5.556
480	12.883	615	73.963	750	4.816
485	13.664	620	71.921	755	4.166
490	15.760	625	69.413	760	3.599
495	19.069	630	66.535	765	3.108
500	23.164	635	63.385	770	2.682
505	27.452	640	59.969	775	2.315
510	31.383	645	56.381	780	1.997

