



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

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Page 1 of 4

REPORT NUMBER: ITL82346
DATE: 07/30/14
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: TRLED2X4-50YN/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: |
| | Yokogawa WT210 Digital Power Meter #8 | N/A |
| | Ocean Optics QE65000 Spectroradiometer | 12/31/14 |
| | 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 (CRIa,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.

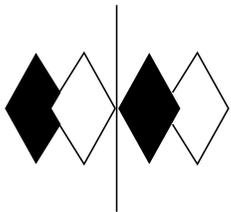
PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were 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)

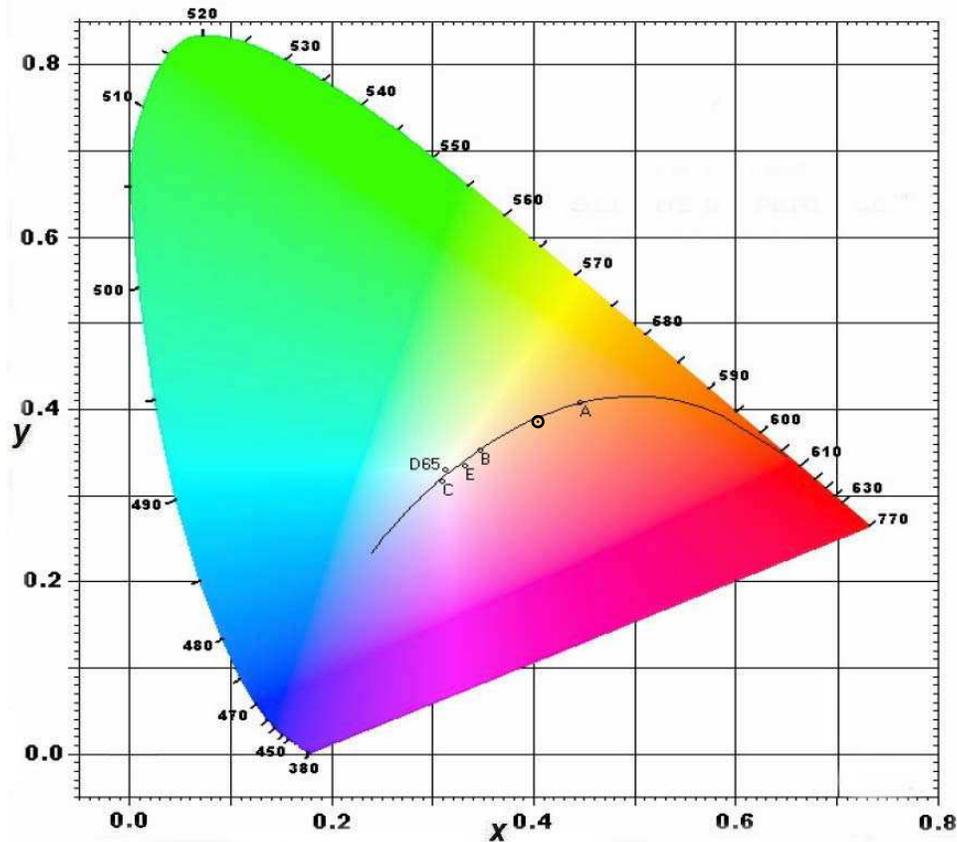
THIS ITL REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.

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



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CIE Chromaticity Diagram





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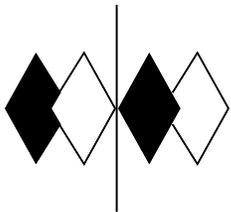
RESULTS:

| SPECTRORADIOMETRIC | |
|---------------------------------|-------------------|
| Observer | CIE 1931 2 degree |
| Chromaticity Ordinate x | 0.4040 |
| Chromaticity Ordinate y | 0.3853 |
| Observer | CIE 1976 2 degree |
| Chromaticity Ordinate u' | 0.2371 |
| Chromaticity Ordinate v' | 0.5088 |
| Correlated Color Temp CCT (K) | 3484 |
| ANSI C78.377-2008 Duv | -0.002 |
| Total Radiant Flux (milliWatts) | 14302 * |
| ELECTRICAL | |
| Input Voltage (Volts AC) | 120.0 |
| Input Current (Amps AC) | 0.432 |
| Input Power (Watts) | 51.4 |
| Input Power Factor (%) | 99.2 |
| Input Current THD (%) | 11.1 |
| 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) | 0.199 |
| Input Power (Watts) | 50.4 |
| Input Power Factor (%) | 91.4 |
| Input Current THD (%) | 13.4 |
| 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 | 94 |
| R4 Moderate yellowish green | 82 |
| R5 Light bluish green | 82 |
| R6 Light blue | 86 |
| R7 Light violet | 87 |
| R8 Light reddish purple | 70 |
| R9 Strong red | 27 |
| 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 | 0.359 | 515 | 41.629 | 650 | 54.379 |
| 385 | 0.371 | 520 | 44.965 | 655 | 50.273 |
| 390 | 0.368 | 525 | 47.875 | 660 | 46.104 |
| 395 | 0.395 | 530 | 50.605 | 665 | 41.782 |
| 400 | 0.459 | 535 | 53.115 | 670 | 37.666 |
| 405 | 0.589 | 540 | 55.637 | 675 | 33.929 |
| 410 | 0.875 | 545 | 58.276 | 680 | 30.699 |
| 415 | 1.482 | 550 | 60.895 | 685 | 27.772 |
| 420 | 2.665 | 555 | 63.635 | 690 | 24.975 |
| 425 | 4.957 | 560 | 66.463 | 695 | 22.255 |
| 430 | 9.144 | 565 | 69.127 | 700 | 19.695 |
| 435 | 15.990 | 570 | 71.628 | 705 | 17.309 |
| 440 | 26.462 | 575 | 73.801 | 710 | 15.171 |
| 445 | 43.746 | 580 | 75.672 | 715 | 13.224 |
| 450 | 65.299 | 585 | 77.141 | 720 | 11.521 |
| 455 | 70.992 | 590 | 77.986 | 725 | 10.025 |
| 460 | 53.824 | 595 | 78.331 | 730 | 8.733 |
| 465 | 38.838 | 600 | 78.215 | 735 | 7.598 |
| 470 | 30.854 | 605 | 77.642 | 740 | 6.618 |
| 475 | 23.777 | 610 | 76.796 | 745 | 5.754 |
| 480 | 19.537 | 615 | 75.463 | 750 | 5.005 |
| 485 | 19.213 | 620 | 73.764 | 755 | 4.342 |
| 490 | 21.023 | 625 | 71.582 | 760 | 3.760 |
| 495 | 24.244 | 630 | 68.906 | 765 | 3.250 |
| 500 | 28.628 | 635 | 65.754 | 770 | 2.797 |
| 505 | 33.369 | 640 | 62.202 | 775 | 2.414 |
| 510 | 37.743 | 645 | 58.393 | 780 | 2.087 |

