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THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

NVLAP LAB CODE: 200925-0

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

PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com



REPORT NUMBER: ITL88146-SPHERE
DATE: 08/26/16
PREPARED FOR: BOYD LIGHTING COMPANY
CATALOG NUMBER: C-10620

ADDRESS: 1455 VAPOR TRAIL
COLORADO SPRINGS, CO 80916

LUMINAIRE: FABRICATED WHITE PAINTED METAL MOUNTING BASE AND SUPPORT ROD, FABRICATED WHITE PAINTED METAL 0.75" WIDE RING HOUSING, 78 LEDS, 3-PIECE TRANSLUCENT WHITE FROSTED PLASTIC DIFFUSER. DIFFUSER FROSTED SIDE OUT.

LAMP: SEVENTY-EIGHT WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.

DRIVER: OSRAM OT25W/PRG1250C/UNV/DIM-1, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST. CLIENT STATES DRIVER PROGRAMMED FOR 700mA OUTPUT.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE DRIVER. LED INFORMATION PROVIDED BY CLIENT.

INSTRUMENTS:

| | Calibration Due: |
|---|---|
| Associated Power Technologies APT5040 AC Power Source | N/A |
| Yokogawa WT210 Digital Power Meter #6 | 12/07/16 |
| Ocean Optics QE65000 Spectroradiometer | 04/19/17 |
| ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry | 04/19/17 |

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Index (CRIa,1-14), Chromaticity Coordinates (x,y; u',v'), ANSI C78.377 Duv, Total Radiant Flux*, Scotopic / Photopic Lumen Ratio, and electrical data including ANSI C82.77-2002 Power Factor (PF) and Total Harmonic Distortion (THD) to the test sample.

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 120VAC input 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.

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 *N WHITE*
Approved *P O'CONNOR*
Sphere Lab Supervisor

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RESULTS:

| PHOTOMETRIC | |
|---|---|
| Total Integrated Flux (lumens) | 1376 * |
| SPECTRORADIOMETRIC | |
| Observer | CIE 1931 2 degree |
| Chromaticity Ordinate x | 0.4606 |
| Chromaticity Ordinate y | 0.4107 |
| Observer | CIE 1976 2 degree |
| Chromaticity Ordinate u' | 0.2629 |
| Chromaticity Ordinate v' | 0.5275 |
| Correlated Color Temp CCT (K) | 2690 |
| ANSI C78.377-2008 Duv | 0.000 |
| Total Radiant Flux (milliWatts) | 4687 * |
| Scotopic / Photopic Lumen Ratio | 1.337 |
| | |
| ELECTRICAL | |
| Input Voltage (Volts AC ) | 120.0 |
| Input Current (Amps AC ) | 0.272 |
| Input Power (Watts) | 32.5 |
| Input Power Factor (%) | 99.6 |
| Input Current THD (%) | 6.4 |
| Input Voltage THD (%) | 0.1 |
| EFFICACY (lumens/Watt) | 42.3 |

| COLOR RENDERING INDICES | CRI |
|---|---|
| Ra (Average 1-8) | 90 |
| R1 Light greyish red | 90 |
| R2 Dark greyish yellow | 97 |
| R3 Strong yellowish green | 96 |
| R4 Moderate yellowish green | 89 |
| R5 Light bluish green | 91 |
| R6 Light blue | 97 |
| R7 Light violet | 87 |
| R8 Light reddish purple | 73 |
| R9 Strong red | 43 |
| R10 Strong yellow | 92 |
| R11 Strong green | 90 |
| R12 Strong blue | 86 |
| R13 Light yellowish pink (skin) | 91 |
| R14 Moderate olive green (leaf) | 99 |

*NOTE: The total lumen output shown on this report was obtained from photometric test ITL88146-GONIOPHOTOMETRY

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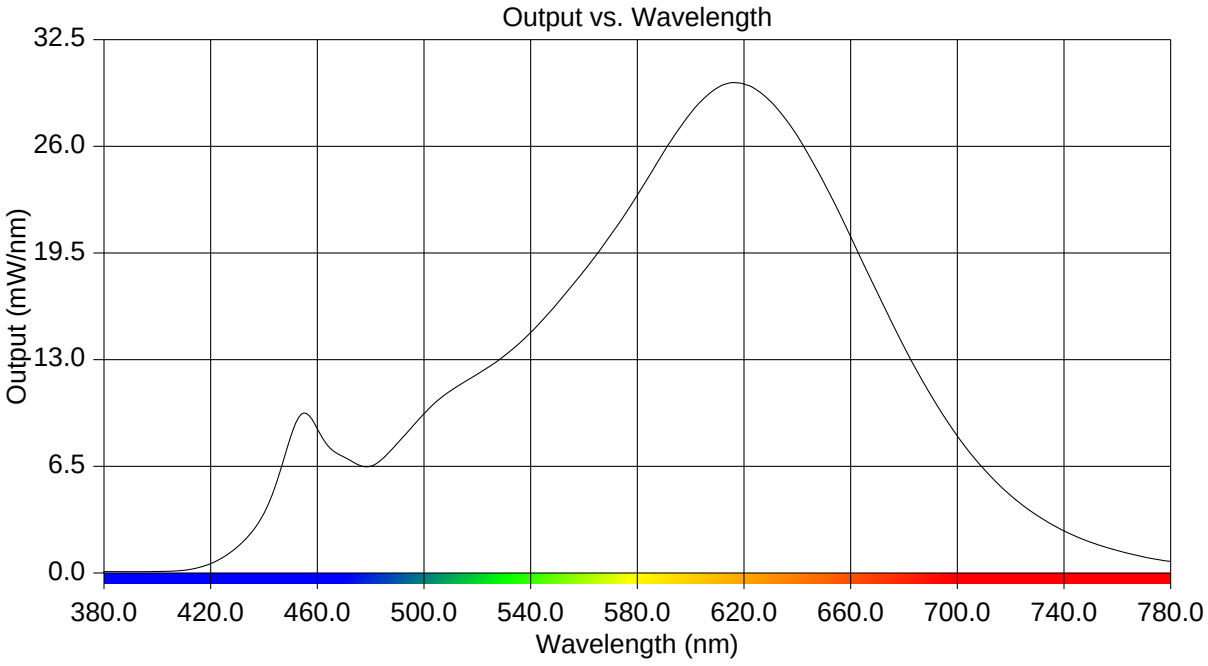
RESULTS:

| Wavelength | mW per nm | Wavelength | mW per nm | Wavelength | mW per nm |
|---|---|---|---|---|---|
| 380 | 0.084 | 515 | 11.627 | 650 | 23.778 |
| 385 | 0.082 | 520 | 12.114 | 655 | 22.188 |
| 390 | 0.080 | 525 | 12.629 | 660 | 20.494 |
| 395 | 0.081 | 530 | 13.220 | 665 | 18.767 |
| 400 | 0.091 | 535 | 13.890 | 670 | 17.085 |
| 405 | 0.110 | 540 | 14.655 | 675 | 15.408 |
| 410 | 0.165 | 545 | 15.511 | 680 | 13.790 |
| 415 | 0.311 | 550 | 16.436 | 685 | 12.271 |
| 420 | 0.572 | 555 | 17.411 | 690 | 10.861 |
| 425 | 0.990 | 560 | 18.414 | 695 | 9.544 |
| 430 | 1.585 | 565 | 19.462 | 700 | 8.349 |
| 435 | 2.412 | 570 | 20.599 | 705 | 7.273 |
| 440 | 3.636 | 575 | 21.762 | 710 | 6.328 |
| 445 | 5.658 | 580 | 23.026 | 715 | 5.473 |
| 450 | 8.307 | 585 | 24.341 | 720 | 4.725 |
| 455 | 9.753 | 590 | 25.683 | 725 | 4.067 |
| 460 | 8.784 | 595 | 26.918 | 730 | 3.502 |
| 465 | 7.576 | 600 | 28.025 | 735 | 2.999 |
| 470 | 7.068 | 605 | 28.929 | 740 | 2.567 |
| 475 | 6.621 | 610 | 29.563 | 745 | 2.194 |
| 480 | 6.503 | 615 | 29.876 | 750 | 1.875 |
| 485 | 7.040 | 620 | 29.799 | 755 | 1.604 |
| 490 | 7.901 | 625 | 29.407 | 760 | 1.369 |
| 495 | 8.800 | 630 | 28.732 | 765 | 1.161 |
| 500 | 9.706 | 635 | 27.784 | 770 | 0.973 |
| 505 | 10.495 | 640 | 26.639 | 775 | 0.824 |
| 510 | 11.105 | 645 | 25.255 | 780 | 0.705 |



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## CIE Chromaticity Diagram