



# Report of Test

## LLIA000817-013A

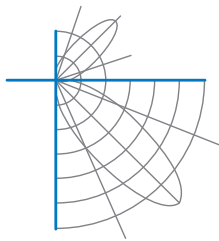
Catalog Number: MLS2-I/D-MO/HO-K40-80-4-XX-AL/AL-XXX-UNV  
 Pendant mounted, extruded aluminum housing, formed white enamel  
 aluminum reflectors, translucent white plastic enclosures.  
 92 white upper LEDs, 92 white lower LEDs  
 Two Osram Optotronic OT30W/PRG1050C/UNV/DIM/L LED drivers  
 120.0Vac, 60.00Hz, 0.3862A, 46.17W, 0.996PF, 5.6%THD(i)



### Performance Summary

|                    |            |
|--------------------|------------|
| Total Light Output | 5090 lm    |
| Luminaire Power    | 46.2 W     |
| Luminous Efficacy  | 110.2 lm/W |

**PREPARED FOR : Precision Architectural Lighting, 4830 Timber Creek Drive, Houston, TX 77017**



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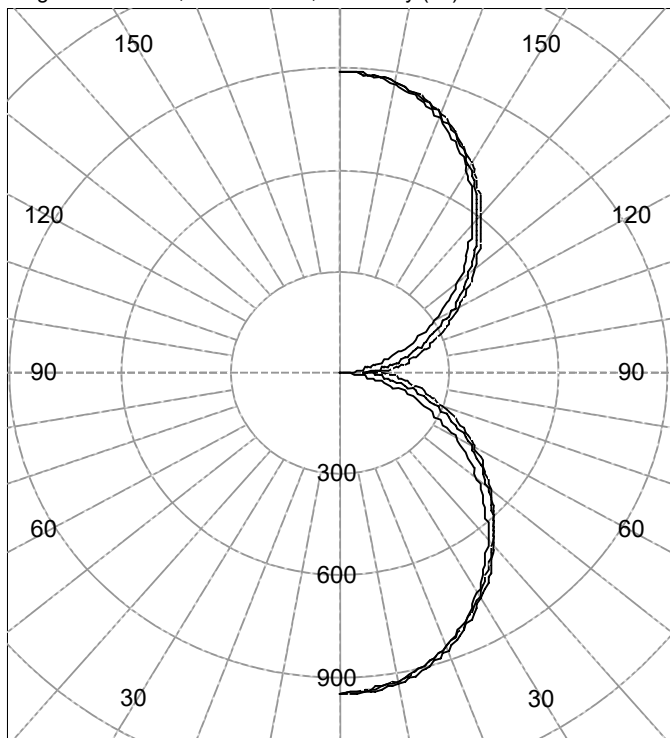
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120.0Vac, 60.00Hz, 0.3862A, 46.17W, 0.996PF, 5.6%THD(i)

Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



(Two plane symmetry) C0-C90

**INTENSITY SUMMARY (cd)**

| Gamma | C-Plane |       |     |       |     | Flux (lm) |
|-------|---------|-------|-----|-------|-----|-----------|
|       | C0      | C22.5 | C45 | C67.5 | C90 |           |
| 0.0   | 945     | 945   | 945 | 945   | 945 |           |
| 5.0   | 939     | 936   | 946 | 944   | 937 | 89        |
| 10.0  | 921     | 919   | 931 | 930   | 921 |           |
| 15.0  | 893     | 892   | 904 | 903   | 894 | 253       |
| 20.0  | 854     | 854   | 868 | 866   | 856 |           |
| 25.0  | 809     | 808   | 822 | 821   | 810 | 375       |
| 30.0  | 752     | 755   | 771 | 770   | 760 |           |
| 35.0  | 693     | 698   | 715 | 716   | 706 | 442       |
| 40.0  | 627     | 636   | 654 | 658   | 650 |           |
| 45.0  | 560     | 572   | 592 | 600   | 594 | 452       |
| 50.0  | 491     | 507   | 530 | 540   | 536 |           |
| 55.0  | 420     | 441   | 466 | 480   | 478 | 411       |
| 60.0  | 349     | 374   | 403 | 419   | 421 |           |
| 65.0  | 279     | 308   | 339 | 359   | 364 | 328       |
| 70.0  | 209     | 240   | 275 | 300   | 307 |           |
| 75.0  | 141     | 175   | 214 | 244   | 254 | 220       |
| 80.0  | 79      | 115   | 159 | 193   | 204 |           |
| 85.0  | 30      | 67    | 113 | 149   | 162 | 116       |
| 90.0  | 1       | 29    | 64  | 92    | 102 |           |

**AVERAGE LUMINANCE (cd / m<sup>2</sup>)**

| Gamma | C0    | C45   | C90   |
|-------|-------|-------|-------|
| 45.0  | 11644 | 10596 | 10043 |
| 55.0  | 10755 | 9711  | 9246  |
| 65.0  | 9684  | 8748  | 8491  |
| 75.0  | 7995  | 7594  | 7779  |
| 85.0  | 5055  | 6718  | 7554  |

**ZONAL FLUX AND PERCENTAGES**

| Zone   | Flux (lm) | % Lamp | % Luminaire |
|--------|-----------|--------|-------------|
| 0-30   | 718       | N / A  | 14.1        |
| 0-40   | 1160      | N / A  | 22.8        |
| 0-60   | 2022      | N / A  | 39.7        |
| 0-90   | 2686      | N / A  | 52.8        |
| 40-90  | 1527      | N / A  | 30.0        |
| 60-90  | 664       | N / A  | 13.0        |
| 90-180 | 2404      | N / A  | 47.2        |
| 0-180  | 5090      | N / A  | 100.0       |

Total Light Output = 5,090 lm

Signed:

Authorized Signatory

Date of test

19-Jul-2017

Date of report

19-Jul-2017



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120.0Vac, 60.00Hz, 0.3862A, 46.17W, 0.996PF, 5.6%THD(i)

**Intensity data (cd)**

| Gamma | C-Plane |       |     |       |     |
|-------|---------|-------|-----|-------|-----|
|       | C0      | C22.5 | C45 | C67.5 | C90 |
| 0.0   | 945     | 945   | 945 | 945   | 945 |
| 2.5   | 944     | 940   | 949 | 947   | 941 |
| 5.0   | 939     | 936   | 946 | 944   | 937 |
| 7.5   | 932     | 929   | 940 | 938   | 931 |
| 10.0  | 921     | 919   | 931 | 930   | 921 |
| 12.5  | 909     | 907   | 919 | 918   | 909 |
| 15.0  | 893     | 892   | 904 | 903   | 894 |
| 17.5  | 875     | 874   | 887 | 886   | 876 |
| 20.0  | 854     | 854   | 868 | 866   | 856 |
| 22.5  | 831     | 832   | 846 | 844   | 834 |
| 25.0  | 809     | 808   | 822 | 821   | 810 |
| 27.5  | 780     | 785   | 797 | 796   | 786 |
| 30.0  | 752     | 755   | 771 | 770   | 760 |
| 32.5  | 722     | 727   | 743 | 743   | 733 |
| 35.0  | 693     | 698   | 715 | 716   | 706 |
| 37.5  | 660     | 669   | 684 | 687   | 678 |
| 40.0  | 627     | 636   | 654 | 658   | 650 |
| 42.5  | 594     | 605   | 623 | 629   | 622 |
| 45.0  | 560     | 572   | 592 | 600   | 594 |
| 47.5  | 526     | 540   | 561 | 570   | 565 |
| 50.0  | 491     | 507   | 530 | 540   | 536 |
| 52.5  | 455     | 474   | 498 | 510   | 507 |
| 55.0  | 420     | 441   | 466 | 480   | 478 |
| 57.5  | 384     | 407   | 435 | 449   | 450 |
| 60.0  | 349     | 374   | 403 | 419   | 421 |
| 62.5  | 314     | 341   | 371 | 389   | 392 |
| 65.0  | 279     | 308   | 339 | 359   | 364 |
| 67.5  | 243     | 274   | 307 | 329   | 335 |
| 70.0  | 209     | 240   | 275 | 300   | 307 |
| 72.5  | 174     | 207   | 244 | 271   | 280 |
| 75.0  | 141     | 175   | 214 | 244   | 254 |
| 77.5  | 109     | 144   | 186 | 218   | 228 |
| 80.0  | 79      | 115   | 159 | 193   | 204 |
| 82.5  | 52      | 89    | 135 | 170   | 182 |
| 85.0  | 30      | 67    | 113 | 149   | 162 |
| 87.5  | 12      | 48    | 92  | 128   | 141 |
| 90.0  | 1       | 29    | 64  | 92    | 102 |



**Test Report No. LLIA000817-013A**

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92 white upper LEDs, 92 white lower LEDs

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120.0Vac, 60.00Hz, 0.3862A, 46.17W, 0.996PF, 5.6%THD(i)

**Intensity data (cd)**

| Gamma | C-Plane |       |     |       |     |
|-------|---------|-------|-----|-------|-----|
|       | C0      | C22.5 | C45 | C67.5 | C90 |
| 90.0  | 1       | 29    | 64  | 92    | 102 |
| 92.5  | 12      | 45    | 75  | 90    | 98  |
| 95.0  | 29      | 62    | 105 | 143   | 157 |
| 97.5  | 47      | 81    | 124 | 161   | 173 |
| 100.0 | 68      | 101   | 144 | 179   | 191 |
| 102.5 | 91      | 123   | 165 | 199   | 210 |
| 105.0 | 115     | 147   | 187 | 219   | 229 |
| 107.5 | 141     | 172   | 210 | 240   | 250 |
| 110.0 | 168     | 198   | 234 | 262   | 272 |
| 112.5 | 197     | 225   | 260 | 286   | 295 |
| 115.0 | 228     | 254   | 286 | 310   | 319 |
| 117.5 | 258     | 283   | 314 | 336   | 344 |
| 120.0 | 290     | 314   | 342 | 362   | 370 |
| 122.5 | 322     | 345   | 372 | 389   | 397 |
| 125.0 | 355     | 376   | 402 | 417   | 424 |
| 127.5 | 388     | 408   | 432 | 445   | 452 |
| 130.0 | 422     | 440   | 463 | 474   | 481 |
| 132.5 | 457     | 473   | 494 | 503   | 510 |
| 135.0 | 492     | 506   | 525 | 533   | 540 |
| 137.5 | 527     | 539   | 556 | 563   | 570 |
| 140.0 | 561     | 571   | 588 | 593   | 601 |
| 142.5 | 595     | 603   | 619 | 623   | 631 |
| 145.0 | 628     | 635   | 649 | 653   | 660 |
| 147.5 | 660     | 666   | 678 | 682   | 689 |
| 150.0 | 692     | 696   | 707 | 710   | 717 |
| 152.5 | 721     | 723   | 734 | 737   | 744 |
| 155.0 | 748     | 749   | 760 | 763   | 768 |
| 157.5 | 773     | 774   | 784 | 787   | 792 |
| 160.0 | 796     | 796   | 806 | 809   | 813 |
| 162.5 | 817     | 816   | 826 | 828   | 831 |
| 165.0 | 836     | 834   | 844 | 845   | 847 |
| 167.5 | 852     | 849   | 858 | 859   | 860 |
| 170.0 | 865     | 862   | 871 | 871   | 871 |
| 172.5 | 875     | 872   | 880 | 880   | 879 |
| 175.0 | 883     | 879   | 887 | 886   | 884 |
| 177.5 | 887     | 882   | 891 | 890   | 886 |
| 180.0 | 888     | 888   | 888 | 888   | 888 |



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aluminum reflectors, translucent white plastic enclosures.  
92 white upper LEDs, 92 white lower LEDs  
Two Osram Optotronic OT30W/PRG1050C/UNV/DIM/L LED drivers  
120.0Vac, 60.00Hz, 0.3862A, 46.17W, 0.996PF, 5.6%THD(i)

**Coefficients Of Utilization - Zonal Cavity Method**

Effective Floor Cavity Reflectance 0.20

| RC | 80  |     |     |     | 70  |     |     |     | 50 |    |    | 30 |    |    | 10 |    |    | 0  |
|----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|
|    | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |    |
| 0  | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 | 53 |
| 1  | 98  | 93  | 89  | 85  | 90  | 86  | 83  | 79  | 73 | 71 | 68 | 62 | 60 | 58 | 51 | 49 | 48 | 43 |
| 2  | 89  | 81  | 74  | 69  | 82  | 75  | 69  | 65  | 64 | 60 | 56 | 54 | 51 | 48 | 44 | 42 | 40 | 35 |
| 3  | 81  | 71  | 63  | 57  | 74  | 66  | 59  | 54  | 56 | 51 | 47 | 47 | 43 | 40 | 39 | 36 | 34 | 30 |
| 4  | 74  | 63  | 54  | 48  | 68  | 58  | 51  | 45  | 50 | 44 | 40 | 42 | 38 | 34 | 35 | 32 | 29 | 25 |
| 5  | 68  | 56  | 47  | 41  | 62  | 52  | 44  | 39  | 44 | 39 | 34 | 38 | 33 | 30 | 31 | 28 | 25 | 22 |
| 6  | 62  | 50  | 42  | 36  | 57  | 47  | 39  | 34  | 40 | 34 | 30 | 34 | 29 | 26 | 28 | 25 | 22 | 19 |
| 7  | 58  | 45  | 37  | 31  | 53  | 42  | 35  | 29  | 36 | 30 | 26 | 31 | 26 | 23 | 26 | 22 | 20 | 17 |
| 8  | 53  | 41  | 33  | 28  | 49  | 38  | 31  | 26  | 33 | 27 | 23 | 28 | 24 | 20 | 24 | 20 | 17 | 15 |
| 9  | 50  | 37  | 30  | 25  | 46  | 35  | 28  | 23  | 30 | 25 | 21 | 26 | 21 | 18 | 22 | 18 | 16 | 14 |
| 10 | 46  | 34  | 27  | 22  | 43  | 32  | 25  | 21  | 28 | 22 | 19 | 24 | 20 | 16 | 20 | 17 | 14 | 12 |

For absolute test reports, CUs are expressed as a percentage of total lumen output. Calculations were based on published IES procedures, and are based on the zonal cavity method. Basic assumptions: 1) Room surfaces are lambertian reflectors. 2) Incident flux on each surface is uniformly distributed. 3) The room is spectrally neutral. When luminaires are not evenly distributed throughout the room, or do not exhibit lateral symmetry, CU values may differ from actual performance.

**Circle of Light Plot**

| Height(ft) | Illuminance at Nadir (fc) | Beam Width<br>(across 50% Nadir Illum) |        |
|------------|---------------------------|--|--------|
|            |                           | 0-180                                  | 90-270 |
| 6.0        | 26.3                      | 7.13                                   | 7.20   |
| 8.0        | 14.8                      | 9.50                                   | 9.60   |
| 10.0       | 9.5                       | 11.88                                  | 12.00  |
| 12.0       | 6.6                       | 14.25                                  | 14.40  |
| 14.0       | 4.8                       | 16.63                                  | 16.80  |
| 16.0       | 3.7                       | 19.00                                  | 19.20  |



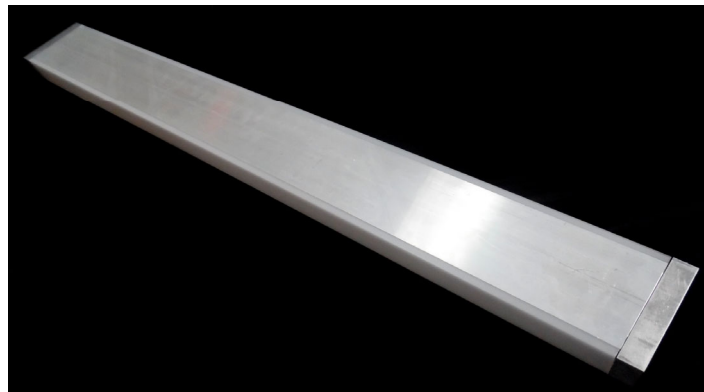
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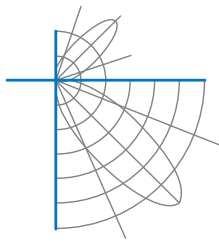
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**Test Distance**            9.5 m  
**Test Temperature**       24.8 °C

**Notes**                      The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

Tested in accordance with the applicable sections of publications: IES LM-79-08 (Sec. 12), IES LM-16-93, IES LM-58-13, CIE 13.3:1995, CIE 15:2004, ANSI C78.377:2015, ANSI C82.77-10:2014.

The luminous intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured.

Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections.

Photometric intensity values are reported using the CIE Gamma coordinate system as defined in CIE publication number 121.

This report may contain data that are not covered by the NVLAP accreditation. Quantities marked with \* are not covered.

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government.



## Report of Test

**LLIA000817-013B**

Integrating Sphere Report

Catalog Number: MLS2-I/D-MO/HO-K40-80-4-XX-AL/AL-XXX-UNV

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### Performance Summary

|              |           |
|--------------|-----------|
| Voltage      | 120.0 Vac |
| Current      | 0.3860 A  |
| Power        | 46.12 W   |
| Frequency    | 60.00 Hz  |
| Power Factor | 0.996     |
| Current THD  | 5.6 %     |

|                     |                  |
|---------------------|------------------|
| Total Luminous Flux | 5157.6 lm        |
| Efficacy            | 111.8 lm/W       |
| Chromaticity (x,y)  | (0.3797, 0.3774) |
| (u',v')             | (0.2243, 0.5018) |
| Duv                 | 0.0005           |
| CCT                 | 4025 K           |
| CRI (Ra)            | 84               |
| R9                  | 18               |

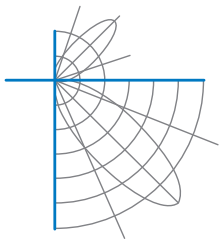
Prepared For:

Precision Architectural Lighting  
4830 Timber Creek Drive  
Houston, TX 77017, USA

Test date: 07/18/2017

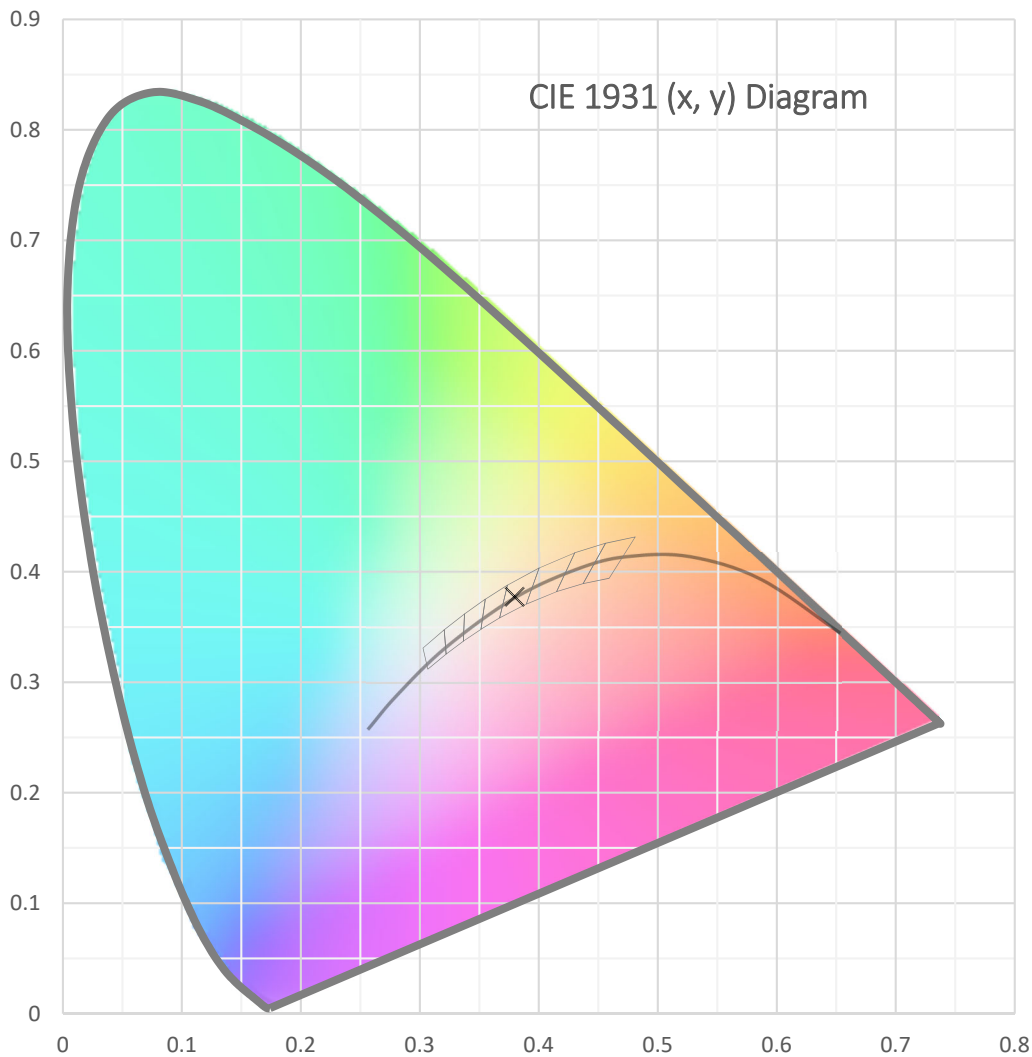
Report date: 07/19/2017

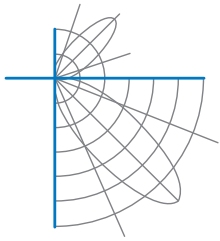




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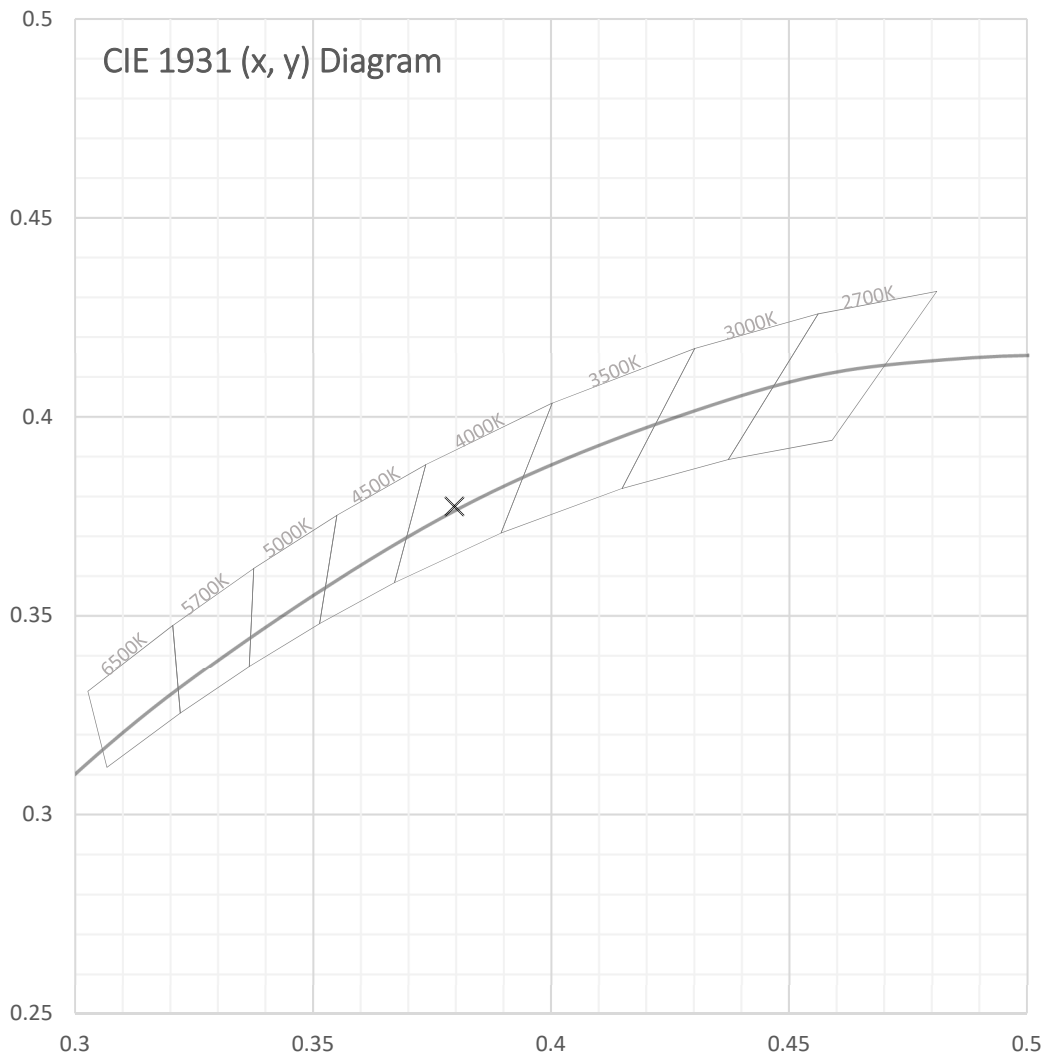
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|                      |                                     |                  |
|----------------------|-------------------------------------|------------------|
| <b>Spectral Data</b> | Total Radiant Flux                  | 16.07 W          |
|                      | Total Luminous Flux                 | 5157.6 Lm        |
|                      | Chromaticity CIE 1931 (x, y)        | (0.3797, 0.3774) |
|                      | Chromaticity CIE 1976 (u', v')      | (0.2243, 0.5018) |
|                      | Correlated Color Temperature (CCT)  | 4025 K           |
|                      | Color Rendering Index (Ra)          | 84               |
|                      | R1                                  | 83               |
|                      | R2                                  | 91               |
|                      | R3                                  | 96               |
|                      | R4                                  | 82               |
|                      | R5                                  | 82               |
|                      | R6                                  | 87               |
|                      | R7                                  | 87               |
|                      | R8                                  | 67               |
|                      | R9                                  | 18               |
|                      | R10                                 | 78               |
|                      | R11                                 | 80               |
|                      | R12                                 | 61               |
|                      | R13                                 | 85               |
|                      | R14                                 | 98               |
|                      | Distance from Planckian Locus (Duv) | 0.0005           |
|                      | Scotopic/Photopic Ratio *           | 1.723            |

**Electrical Data**

|              |           |
|--------------|-----------|
| Voltage      | 120.0 Vac |
| Current      | 0.3860 A  |
| Power        | 46.12 W   |
| Frequency    | 60.00 Hz  |
| Power Factor | 0.996     |
| Current THD  | 5.6 %     |

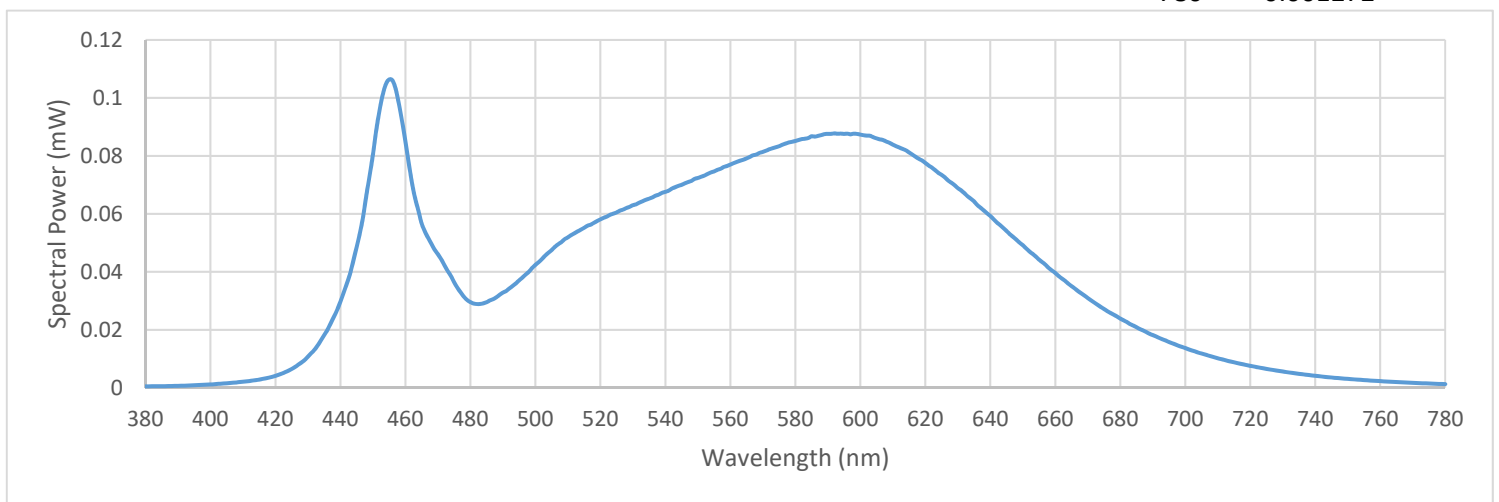


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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

|     |          |     |          |     |          |     |          |
|-----|----------|-----|----------|-----|----------|-----|----------|
| 380 | 0.000510 | 480 | 0.029555 | 580 | 0.085143 | 680 | 0.023860 |
| 385 | 0.000541 | 485 | 0.029535 | 585 | 0.086772 | 685 | 0.020886 |
| 390 | 0.000674 | 490 | 0.032831 | 590 | 0.087592 | 690 | 0.018179 |
| 395 | 0.000861 | 495 | 0.037070 | 595 | 0.087601 | 695 | 0.015772 |
| 400 | 0.001155 | 500 | 0.042390 | 600 | 0.087346 | 700 | 0.013706 |
| 405 | 0.001556 | 505 | 0.047511 | 605 | 0.086042 | 705 | 0.011822 |
| 410 | 0.002076 | 510 | 0.051899 | 610 | 0.083869 | 710 | 0.010158 |
| 415 | 0.002819 | 515 | 0.055185 | 615 | 0.081189 | 715 | 0.008802 |
| 420 | 0.004124 | 520 | 0.058077 | 620 | 0.077566 | 720 | 0.007570 |
| 425 | 0.006486 | 525 | 0.060506 | 625 | 0.073442 | 725 | 0.006517 |
| 430 | 0.010732 | 530 | 0.062992 | 630 | 0.068901 | 730 | 0.005610 |
| 435 | 0.018155 | 535 | 0.065243 | 635 | 0.064298 | 735 | 0.004816 |
| 440 | 0.029749 | 540 | 0.067606 | 640 | 0.059258 | 740 | 0.004129 |
| 445 | 0.048617 | 545 | 0.070025 | 645 | 0.054093 | 745 | 0.003560 |
| 450 | 0.080424 | 550 | 0.072377 | 650 | 0.049194 | 750 | 0.003065 |
| 455 | 0.106340 | 555 | 0.074638 | 655 | 0.044210 | 755 | 0.002651 |
| 460 | 0.084905 | 560 | 0.077008 | 660 | 0.039587 | 760 | 0.002299 |
| 465 | 0.056676 | 565 | 0.079123 | 665 | 0.035078 | 765 | 0.001982 |
| 470 | 0.046077 | 570 | 0.081375 | 670 | 0.030947 | 770 | 0.001707 |
| 475 | 0.036382 | 575 | 0.083335 | 675 | 0.027190 | 775 | 0.001475 |
|     |          |     |          |     |          | 780 | 0.001272 |





**Test Report Number: LLIA000817-013B**

Catalog Number: MLS2-I/D-MO/HO-K40-80-4-XX-AL/AL-XXX-UNV  
Pendant mounted, extruded aluminum housing, formed white enamel  
aluminum reflectors, translucent white plastic enclosures.  
92 white upper LEDs, 92 white lower LEDs  
Two Osram Optotronic OT30W/PRG1050C/UNV/DIM/L LED drivers

**Test Equipment Configuration:** LightLab International Allentown 2m Integrating Sphere  
Measurements acquired using a Labsphere CDS 2600 spectroradiometer  
Testing was performed using 4 $\pi$  geometry

**Test Temperature:** 25.4 °C

**Test Procedure:** Tested in accordance with the applicable sections of:  
LM-79-08, LM-78-07, LM-58-13, ANSI\_ANSLG C78.377-2015, ANSI C82-77-10:2014

**Significance:** The laboratory has not participated in the selection of samples to be tested.  
All testing is performed on the understanding that the significance of the report  
is limited to the extent that the test sample is representative of production units.

**Notes:** The measurements and other derived quantities contained in this report  
are based on the absolute data as measured.

Prorating the performance of the sample for the use of other component  
combinations (such as lamp / LED / Ballast / driver), or for use in different  
environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections

This report may contain data that are not covered by the NVLAP accreditation.  
Quantities marked with \* are not covered.