

## Report of Test

**LLIA001449-001**

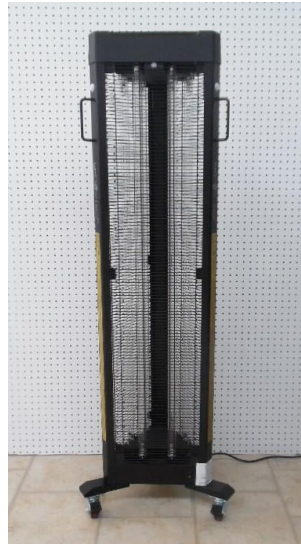
Distribution Radiometry Test Report

Catalog Number: LC-UVC-Tower-216W-01

Portable black formed aluminum and black plastic housing with black steel screen enclosures.

Six vertical clear 36W Philips F36W TUV lamps

Three 72W Power Supplies, Model: CJUVQ72HPE-T8D



Prepared For:

Light Efficient Design  
188 S. Northwest Highway  
Cary, IL 60013, USA

### Performance Summary

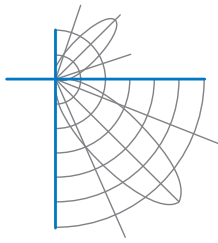
|               |          |                    |  |
|---------------|----------|--------------------|--|
| Input Voltage | 120.0 V  | Radiant Power      | 49588 mW <sub>UV-C</sub>                   |
| Input Current | 1.944 A  | Radiant Efficiency | 0.214 W <sub>UV-C</sub> /W <sub>elec</sub> |
| Input Power   | 231.6 W  | Downward           | 24750 mW <sub>UV-C</sub>                   |
| Frequency     | 60.00 Hz | Upward             | 24838 mW <sub>UV-C</sub>                   |
| Power Factor  | 0.993    |                    |  |
| Current THD   | 8.3 %    |                    |  |

This test report was issued by LightLab International Allentown, LLC without alterations or erasures.

Test date: 04/29/2021

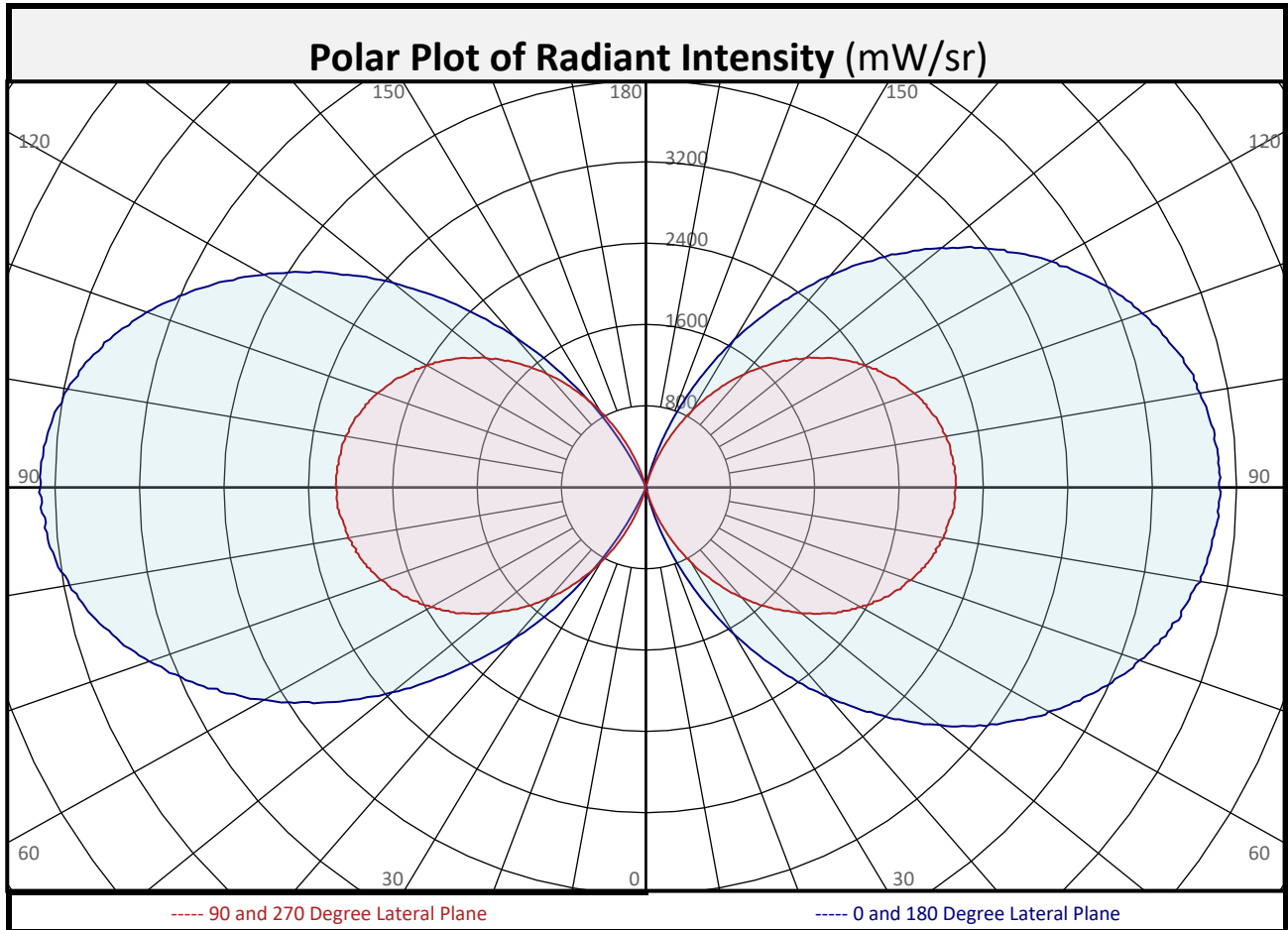
Report date: 04/30/2021

Signed: \_\_\_\_\_

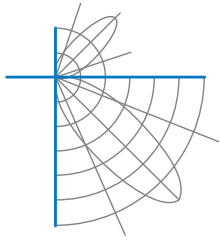


Report of Test

LLIA001449-001



| Zonal Radiant Power Summary |                                     |                  |                 |                                     |                  |                 |                                     |                  |
|-----------------------------|-------------------------------------|------------------|-----------------|-------------------------------------|------------------|-----------------|-------------------------------------|------------------|
| Zone (Deg Vert)             | Radiant Power (mW <sub>UV-C</sub> ) | Percent of Total | Zone (Deg Vert) | Radiant Power (mW <sub>UV-C</sub> ) | Percent of Total | Zone (Deg Vert) | Radiant Power (mW <sub>UV-C</sub> ) | Percent of Total |
| 0-10                        | 0.0                                 | 0.0%             | 90-100          | 6315                                | 12.7%            | 0-20            | 44.7                                | 0.1%             |
| 10-20                       | 44.7                                | 0.1%             | 100-110         | 5824                                | 11.7%            | 0-30            | 473.1                               | 1.0%             |
| 20-30                       | 428.4                               | 0.9%             | 110-120         | 4893                                | 9.9%             | 0-40            | 1723                                | 3.5%             |
| 30-40                       | 1250                                | 2.5%             | 120-130         | 3686                                | 7.4%             | 0-60            | 7789                                | 15.7%            |
| 40-50                       | 2392                                | 4.8%             | 130-140         | 2403                                | 4.8%             | 0-80            | 18452                               | 37.2%            |
| 50-60                       | 3674                                | 7.4%             | 140-150         | 1252                                | 2.5%             | 10-90           | 24750                               | 49.9%            |
| 60-70                       | 4870                                | 9.8%             | 150-160         | 423.3                               | 0.9%             | 20-50           | 4070                                | 8.2%             |
| 70-80                       | 5793                                | 11.7%            | 160-170         | 41.0                                | 0.1%             | 40-90           | 23028                               | 46.4%            |
| 80-90                       | 6299                                | 12.7%            | 170-180         | 0.0                                 | 0.0%             | 60-90           | 16961                               | 34.2%            |
| 0-90                        | 24750                               | 49.9%            | 90-180          | 24838                               | 50.1%            | 0-180           | 49588                               | 100.0%           |

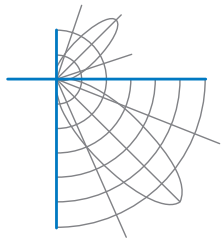


## Report of Test

LLIA001449-001

Radiant Intensity (mW/sr) Table

|  |      | Lateral (C-Plane) Angles |      |      |      |      |       |      |       |      |
|--|------|--------------------------|------|------|------|------|-------|------|-------|------|
|  |      | 0                        | 22.5 | 45   | 67.5 | 90   | 112.5 | 135  | 157.5 | 180  |
| Vertical (Gamma) Angles - Data was acquired in 0.5° increments, 2.5° increments shown. | 0    | 0                        | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    |
|  | 2.5  | 0                        | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    |
|  | 5    | 0                        | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    |
|  | 7.5  | 0                        | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    |
|  | 10   | 0                        | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    |
|  | 12.5 | 31                       | 0    | 0    | 0    | 0    | 51    | 34   | 0     | 0    |
|  | 15   | 194                      | 120  | 0    | 0    | 45   | 252   | 230  | 12    | 0    |
|  | 17.5 | 406                      | 300  | 48   | 0    | 156  | 514   | 493  | 155   | 0    |
|  | 20   | 637                      | 526  | 205  | 66   | 283  | 816   | 814  | 334   | 0    |
|  | 22.5 | 878                      | 776  | 386  | 226  | 407  | 1165  | 1166 | 542   | 58   |
|  | 25   | 1138                     | 1028 | 566  | 414  | 557  | 1524  | 1536 | 775   | 224  |
|  | 27.5 | 1397                     | 1302 | 784  | 601  | 701  | 1890  | 1903 | 1002  | 468  |
|  | 30   | 1666                     | 1566 | 999  | 840  | 846  | 2266  | 2297 | 1256  | 748  |
|  | 32.5 | 1920                     | 1834 | 1214 | 1132 | 998  | 2642  | 2699 | 1480  | 1033 |
|  | 35   | 2174                     | 2110 | 1440 | 1429 | 1138 | 3025  | 3079 | 1735  | 1334 |
|  | 37.5 | 2436                     | 2390 | 1674 | 1724 | 1282 | 3410  | 3473 | 1978  | 1651 |
|  | 40   | 2690                     | 2656 | 1926 | 2036 | 1414 | 3767  | 3853 | 2213  | 1940 |
|  | 42.5 | 2937                     | 2906 | 2206 | 2337 | 1543 | 4137  | 4238 | 2458  | 2251 |
|  | 45   | 3172                     | 3162 | 2485 | 2641 | 1673 | 4479  | 4602 | 2685  | 2545 |
|  | 47.5 | 3414                     | 3424 | 2754 | 2937 | 1801 | 4847  | 4972 | 2927  | 2847 |
| 50   | 3632 | 3665                     | 3023 | 3224 | 1928 | 5169 | 5298  | 3134 | 3133  |      |
| 52.5   | 3858 | 3891                     | 3285 | 3520 | 2042 | 5488 | 5652  | 3354 | 3423  |      |
| 55   | 4065 | 4111                     | 3539 | 3773 | 2160 | 5774 | 5965  | 3553 | 3685  |      |
| 57.5   | 4248 | 4312                     | 3788 | 4038 | 2259 | 6059 | 6258  | 3755 | 3949  |      |
| 60   | 4408 | 4501                     | 4020 | 4277 | 2358 | 6327 | 6533  | 3939 | 4179  |      |
| 62.5   | 4571 | 4686                     | 4233 | 4516 | 2433 | 6567 | 6775  | 4113 | 4400  |      |
| 65   | 4731 | 4847                     | 4443 | 4735 | 2537 | 6794 | 7028  | 4259 | 4628  |      |
| 67.5   | 4861 | 4992                     | 4631 | 4931 | 2614 | 6992 | 7242  | 4402 | 4817  |      |
| 70   | 4977 | 5130                     | 4800 | 5098 | 2670 | 7180 | 7437  | 4535 | 5009  |      |
| 72.5   | 5102 | 5251                     | 4963 | 5273 | 2733 | 7335 | 7603  | 4644 | 5184  |      |
| 75   | 5168 | 5365                     | 5095 | 5424 | 2782 | 7493 | 7755  | 4734 | 5318  |      |
| 77.5   | 5256 | 5446                     | 5222 | 5540 | 2811 | 7593 | 7884  | 4817 | 5443  |      |
| 80   | 5340 | 5523                     | 5331 | 5643 | 2868 | 7699 | 7987  | 4892 | 5548  |      |
| 82.5   | 5369 | 5595                     | 5398 | 5719 | 2882 | 7766 | 8072  | 4952 | 5636  |      |
| 85   | 5408 | 5639                     | 5456 | 5781 | 2919 | 7832 | 8124  | 4987 | 5692  |      |
| 87.5   | 5425 | 5657                     | 5505 | 5823 | 2932 | 7861 | 8166  | 5011 | 5731  |      |
| 90   | 5434 | 5676                     | 5508 | 5834 | 2928 | 7868 | 8193  | 5027 | 5739  |      |

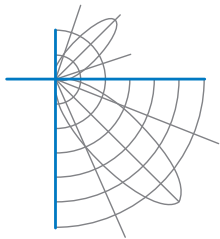


## Report of Test

LLIA001449-001

Radiant Intensity (mW/sr) Table

|  |       | Lateral (C-Plane) Angles |      |      |      |      |       |      |       |      |
|--|-------|--------------------------|------|------|------|------|-------|------|-------|------|
|  |       | 0                        | 22.5 | 45   | 67.5 | 90   | 112.5 | 135  | 157.5 | 180  |
| Vertical (Gamma) Angles - Data was acquired in 0.5° increments, 2.5° increments shown. | 90    | 5434                     | 5676 | 5508 | 5834 | 2928 | 7868  | 8193 | 5027  | 5739 |
|  | 92.5  | 5430                     | 5673 | 5498 | 5831 | 2935 | 7876  | 8183 | 5011  | 5738 |
|  | 95    | 5407                     | 5661 | 5474 | 5792 | 2925 | 7848  | 8151 | 4998  | 5699 |
|  | 97.5  | 5380                     | 5618 | 5421 | 5746 | 2909 | 7797  | 8092 | 4957  | 5652 |
|  | 100   | 5335                     | 5572 | 5344 | 5659 | 2893 | 7721  | 8026 | 4912  | 5564 |
|  | 102.5 | 5286                     | 5488 | 5249 | 5567 | 2855 | 7630  | 7932 | 4848  | 5466 |
|  | 105   | 5205                     | 5414 | 5121 | 5434 | 2805 | 7504  | 7801 | 4754  | 5333 |
|  | 107.5 | 5115                     | 5300 | 4971 | 5302 | 2758 | 7360  | 7641 | 4663  | 5200 |
|  | 110   | 5003                     | 5179 | 4824 | 5129 | 2706 | 7214  | 7475 | 4541  | 5035 |
|  | 112.5 | 4894                     | 5048 | 4649 | 4954 | 2637 | 7017  | 7268 | 4408  | 4831 |
|  | 115   | 4748                     | 4887 | 4457 | 4740 | 2560 | 6815  | 7063 | 4284  | 4640 |
|  | 117.5 | 4595                     | 4730 | 4242 | 4526 | 2477 | 6586  | 6807 | 4110  | 4409 |
|  | 120   | 4440                     | 4530 | 4022 | 4290 | 2396 | 6331  | 6548 | 3934  | 4179 |
|  | 122.5 | 4263                     | 4357 | 3802 | 4065 | 2304 | 6064  | 6256 | 3741  | 3943 |
|  | 125   | 4071                     | 4145 | 3554 | 3796 | 2204 | 5775  | 5952 | 3553  | 3680 |
|  | 127.5 | 3884                     | 3934 | 3302 | 3515 | 2083 | 5472  | 5642 | 3346  | 3410 |
|  | 130   | 3662                     | 3700 | 3036 | 3229 | 1974 | 5153  | 5309 | 3130  | 3127 |
|  | 132.5 | 3442                     | 3464 | 2786 | 2942 | 1850 | 4818  | 4965 | 2908  | 2831 |
|  | 135   | 3201                     | 3210 | 2499 | 2651 | 1725 | 4470  | 4611 | 2684  | 2543 |
|  | 137.5 | 2971                     | 2957 | 2224 | 2348 | 1586 | 4126  | 4240 | 2450  | 2241 |
|  | 140   | 2712                     | 2696 | 1955 | 2042 | 1447 | 3755  | 3867 | 2204  | 1936 |
|  | 142.5 | 2452                     | 2427 | 1696 | 1738 | 1314 | 3395  | 3471 | 1967  | 1630 |
|  | 145   | 2191                     | 2143 | 1463 | 1433 | 1161 | 3006  | 3074 | 1708  | 1303 |
|  | 147.5 | 1927                     | 1886 | 1236 | 1130 | 1006 | 2633  | 2681 | 1460  | 1004 |
|  | 150   | 1684                     | 1593 | 1023 | 837  | 851  | 2246  | 2284 | 1211  | 725  |
|  | 152.5 | 1396                     | 1321 | 814  | 598  | 711  | 1855  | 1897 | 968   | 439  |
|  | 155   | 1128                     | 1050 | 589  | 388  | 565  | 1492  | 1503 | 743   | 168  |
|  | 157.5 | 878                      | 782  | 392  | 215  | 413  | 1138  | 1128 | 506   | 27   |
|  | 160   | 620                      | 539  | 205  | 55   | 278  | 799   | 768  | 304   | 0    |
|  | 162.5 | 397                      | 308  | 55   | 0    | 148  | 474   | 454  | 110   | 0    |
| 165  | 187   | 101                      | 0    | 0    | 29   | 213  | 191   | 0    | 0     |      |
| 167.5  | 20    | 0                        | 0    | 0    | 0    | 20   | 0     | 0    | 0     |      |
| 170  | 0     | 0                        | 0    | 0    | 0    | 0    | 0     | 0    | 0     |      |
| 172.5  | 0     | 0                        | 0    | 0    | 0    | 0    | 0     | 0    | 0     |      |
| 175  | 0     | 0                        | 0    | 0    | 0    | 0    | 0     | 0    | 0     |      |
| 177.5  | 0     | 0                        | 0    | 0    | 0    | 0    | 0     | 0    | 0     |      |
| 180  | 0     | 0                        | 0    | 0    | 0    | 0    | 0     | 0    | 0     |      |

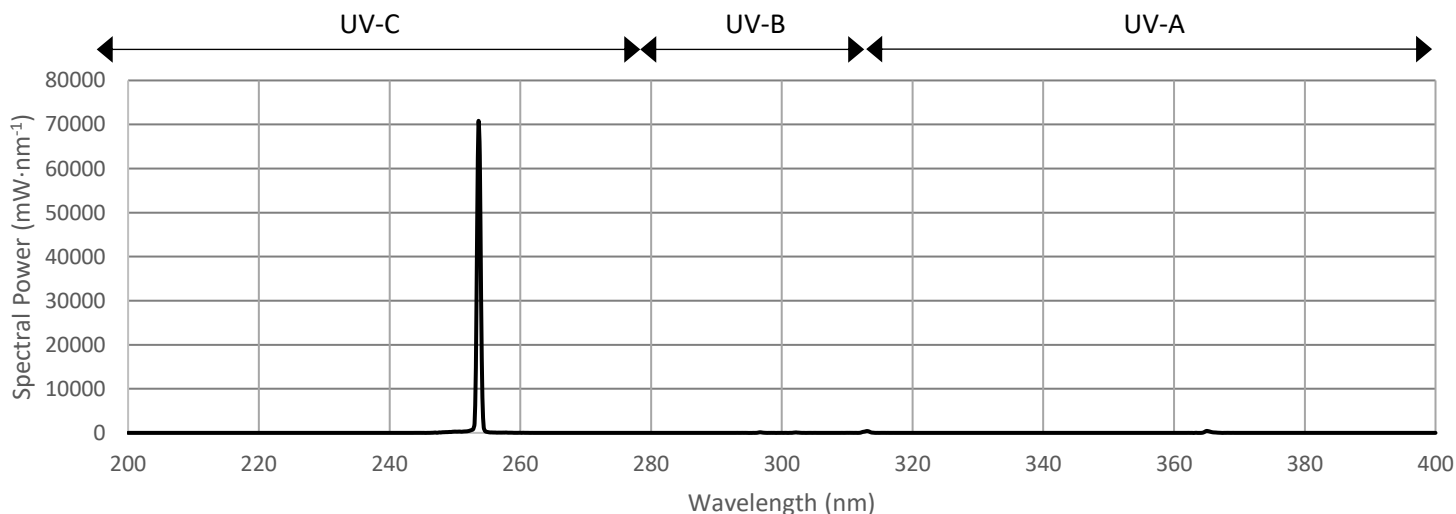


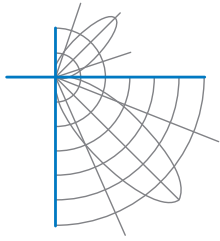
## Report of Test

LLIA001449-001

### Spectral Radiant Flux Summary

| Radiant Flux Tabulation |                                 |                  |  |
|-------------------------|---------------------------------|------------------|--|
| Waveband (nm)           | Radiant Flux (mW <sub>r</sub> ) | Percent of Total | Efficiency (W <sub>r</sub> /W <sub>e</sub> ) |
| UV-C<br>200-250         | 493.7                           | 1.0%             | 0.002  |
| UV-C<br>200-280         | 49587.9                         | 97.8%            | 0.214  |
| UV-B<br>280-315         | 612.6                           | 1.2%             | 0.003  |
| UV-A<br>315-400         | 500.6                           | 1.0%             | 0.002  |
| Total UV<br>200-400     | 50701.1                         | 100.0%           | 0.219  |



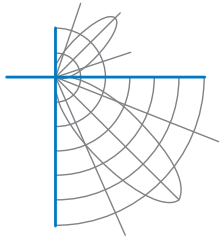


## Report of Test

LLIA001449-001

| Coefficients of Utilization/Room Utilization - Zonal Cavity Method |     |     |     |     |  |    |    |    |    |  |    |    |    |  |    |    |    |  |    |    |    |    |
|--|-----|-----|-----|-----|--|----|----|----|----|--|----|----|----|--|----|----|----|--|----|----|----|----|
| Effective Floor Cavity Reflectance 0.20                            |     |     |     |     |  |    |    |    |    |  |    |    |    |  |    |    |    |  |    |    |    |    |
| RC   | 80  |     |     |     |  | 70 |    |    |    |  | 50 |    |    |  | 30 |    |    |  | 10 |    |    | 0  |
| RW   | 70  | 50  | 30  | 10  |  | 70 | 50 | 30 | 10 |  | 50 | 30 | 10 |  | 50 | 30 | 10 |  | 50 | 30 | 10 | 0  |
| RCR  |     |     |     |     |  |    |    |    |    |  |    |    |    |  |    |    |    |  |    |    |    |    |
| 0  | 107 | 107 | 107 | 107 |  | 99 | 99 | 99 | 99 |  | 83 | 83 | 83 |  | 69 | 69 | 69 |  | 56 | 56 | 56 | 50 |
| 1  | 91  | 84  | 78  | 72  |  | 83 | 77 | 71 | 66 |  | 63 | 59 | 55 |  | 51 | 47 | 44 |  | 39 | 37 | 34 | 28 |
| 2  | 80  | 70  | 61  | 53  |  | 73 | 63 | 56 | 49 |  | 52 | 45 | 40 |  | 41 | 36 | 32 |  | 31 | 27 | 24 | 19 |
| 3  | 72  | 59  | 49  | 41  |  | 65 | 54 | 45 | 38 |  | 43 | 36 | 31 |  | 34 | 29 | 24 |  | 25 | 21 | 17 | 13 |
| 4  | 65  | 51  | 41  | 33  |  | 58 | 46 | 37 | 30 |  | 37 | 30 | 24 |  | 29 | 23 | 19 |  | 21 | 17 | 13 | 9  |
| 5  | 59  | 44  | 35  | 27  |  | 53 | 40 | 31 | 25 |  | 32 | 25 | 20 |  | 25 | 20 | 15 |  | 18 | 14 | 10 | 7  |
| 6  | 54  | 39  | 30  | 23  |  | 48 | 36 | 27 | 21 |  | 29 | 22 | 16 |  | 22 | 17 | 12 |  | 16 | 12 | 8  | 5  |
| 7  | 49  | 35  | 26  | 19  |  | 44 | 32 | 23 | 17 |  | 26 | 19 | 14 |  | 20 | 14 | 10 |  | 15 | 10 | 7  | 4  |
| 8  | 45  | 31  | 22  | 16  |  | 41 | 29 | 20 | 15 |  | 23 | 16 | 12 |  | 18 | 13 | 9  |  | 13 | 9  | 6  | 3  |
| 9  | 42  | 28  | 20  | 14  |  | 38 | 26 | 18 | 13 |  | 21 | 15 | 10 |  | 16 | 11 | 8  |  | 12 | 8  | 5  | 3  |
| 10   | 39  | 26  | 18  | 12  |  | 36 | 23 | 16 | 11 |  | 19 | 13 | 9  |  | 15 | 10 | 7  |  | 11 | 7  | 4  | 2  |

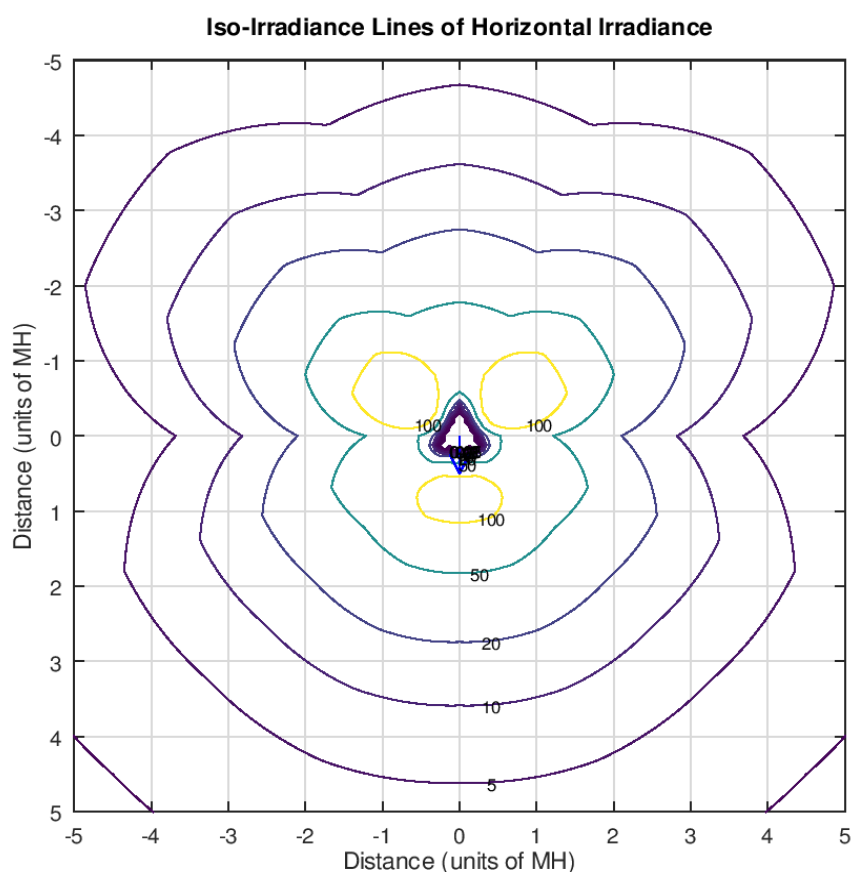
For absolute test reports, RUs are expressed as a percentage of total light output. For relative test reports, CUs are expressed as a percentage of total lamp output. Calculations were based on published IES procedures, and are based on the zonal cavity method. Basic assumptions: 1) Room surfaces are 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.



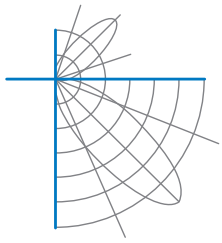
## Report of Test

LLIA001449-001

### Iso-Irradiance Plot



The iso-irradiance values shown in the plot above are based on a mounting height of  $h = 1.00$  meters. Grid values show multiples of mounting height. The iso-irradiance contour lines are expressed in units of  $\mu\text{W}/\text{cm}^2$ . The values expressed are based on the direct light from a single unit without the contribution of room reflections.



## Report of Test

### LLIA001449-001

Test Distance                    9.5 m  
Ambient Temperature        25.5 °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.

Type "C" goniometer geometry and angular increments are based on guidance from IES LM-75. Tested in accordance with the applicable sections of IES LM-79-19. Format of reports and angular increments based on IES LM-41-14 and LM-46-04.

This test has been performed using the absolute method of radiometry.

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.