

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269

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Peachtree City, GA 30269

Scaled data based on original data using  
LM-79-2024 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: STREETWORKS

Report Number: P1461504

Luminaire Tested: USSL-150-750-U-T2R-HSS

Issue Date: 06/10/2026

**Test Information**

Test Method: LM-79-2024  
Report Number: P1461504  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 6/11/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: USSL-150-750-U-T2R-HSS  
Description: USSL DISCRETE LED 1 SQUARE 150W 70CRI 5000K FIXTURE w/ TYPE II ROADWAY  
DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD  
Light Source: (40) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14868.6 lumens  
Efficiency: N/A  
Efficacy: 97.8 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.67' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G2

Input Watts (W): 152  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.98  
Total Harmonic Distortion (THDi): 2.75%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

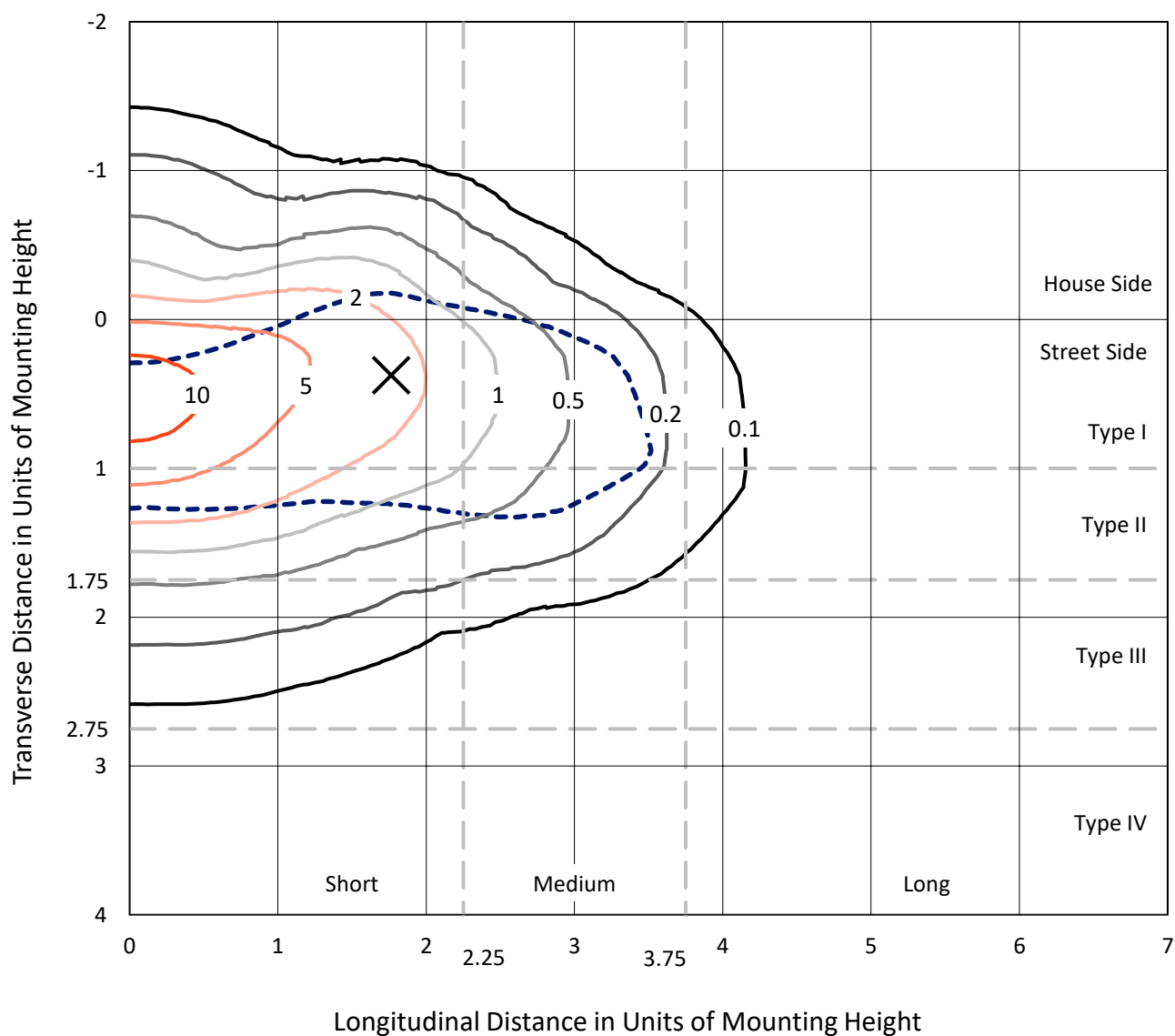
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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd



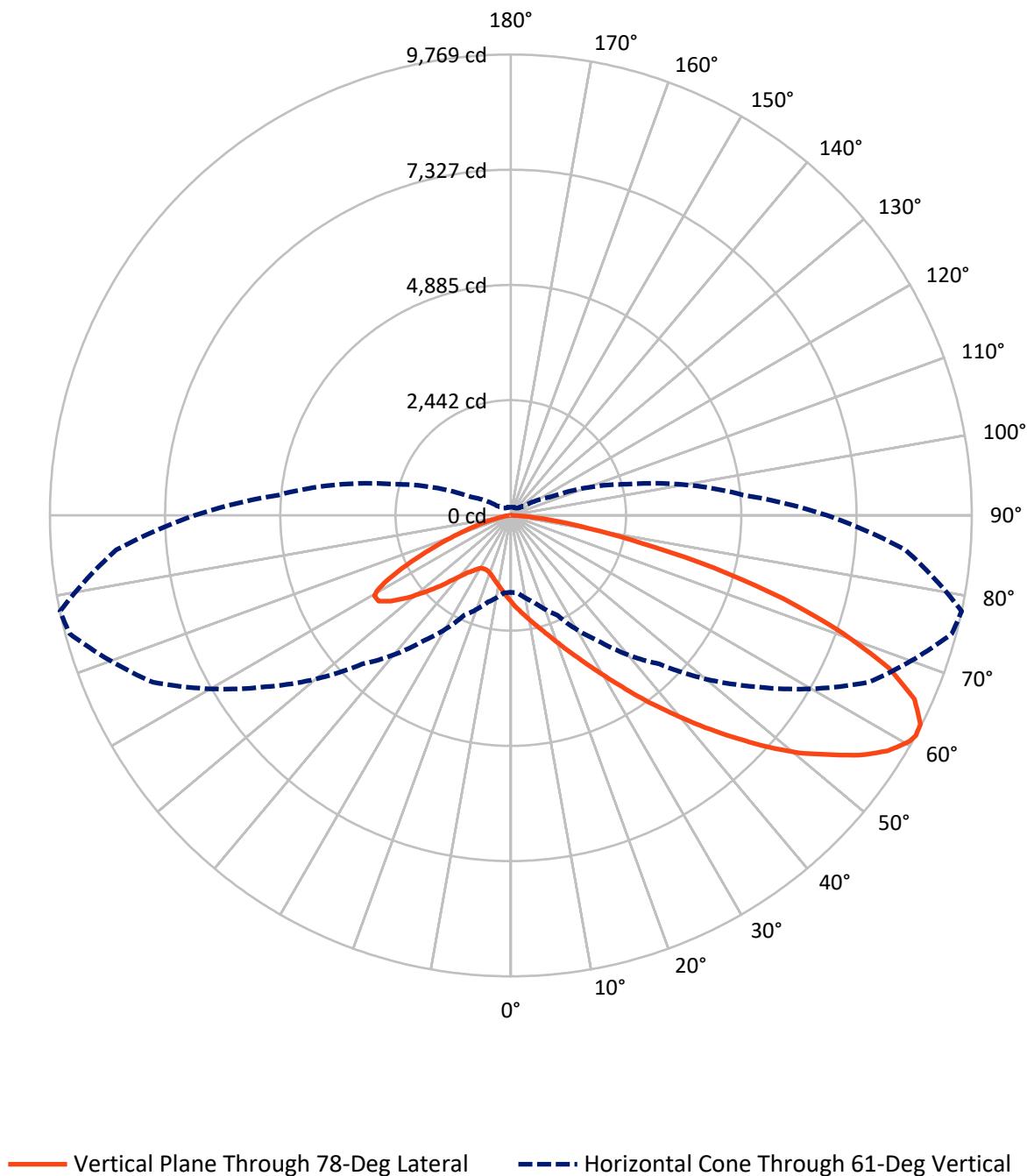
Based on 20 foot mounting height. Maximum calculated value = 12.5 fc

Type II - Short - N/A

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## Luminous Intensity Polar Plot



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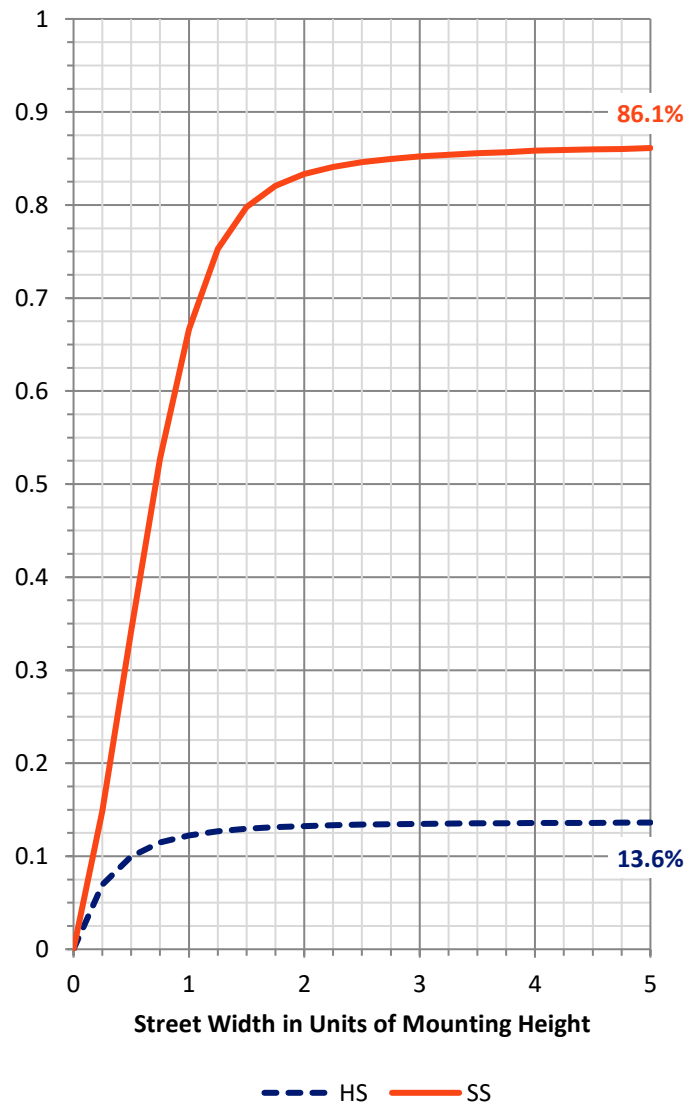
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2040.6   | 0.0    | 2040.6  |
|                    | % Fixture | 13.7     | 0.0    | 13.7    |
| <b>Street Side</b> | Lumens    | 12828.0  | 0.0    | 12828.0 |
|                    | % Fixture | 86.3     | 0.0    | 86.3    |
| <b>Total</b>       | Lumens    | 14868.6  | 0.0    | 14868.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 185.7   | 1.2       |
| 10°-20°   | 662.3   | 4.5       |
| 20°-30°   | 1369.9  | 9.2       |
| 30°-40°   | 2356.5  | 15.8      |
| 40°-50°   | 3175.3  | 21.4      |
| 50°-60°   | 3287.6  | 22.1      |
| 60°-70°   | 2555.0  | 17.2      |
| 70°-80°   | 1120.2  | 7.5       |
| 80°-90°   | 156.2   | 1.1       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 14868.6 | 100.0     |
| 0°-180°   | 14868.6 | 100.0     |

**Coefficient of Utilization**



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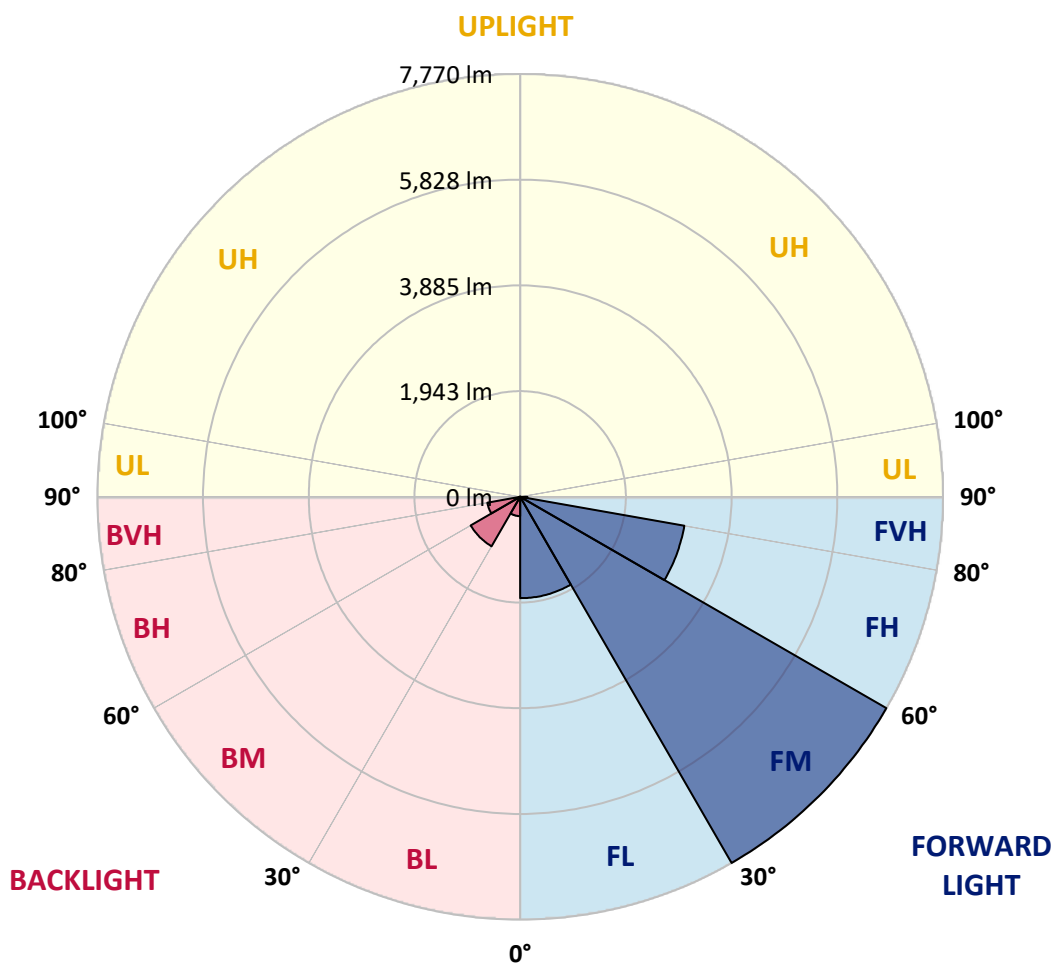
CATALOG NUMBER: USSL-150-750-U-T2R-HSS

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1862.9 | 12.5      |                         |      |         |
| FM   | (30°-60°)   | 7770.4 | 52.3      |                         |      |         |
| FH   | (60°-80°)   | 3062.9 | 20.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 131.9  | 0.9       |                         |      | G2/225  |
| BL   | (0°-30°)    | 354.9  | 2.4       | B1/500                  |      |         |
| BM   | (30°-60°)   | 1049.1 | 7.1       | B2/2500                 |      |         |
| BH   | (60°-80°)   | 612.3  | 4.1       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 24.3   | 0.2       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 78°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 |
| 2.5°  | 2323.6 | 2294.6 | 2316.6 | 2271.6 | 2229.6 | 2178.7 | 2120.7 | 2044.8 | 1965.8 | 1938.8 | 1882.9 |
| 5°    | 2760.3 | 2777.3 | 2762.3 | 2705.4 | 2622.4 | 2486.5 | 2383.5 | 2237.6 | 2092.7 | 2035.8 | 1927.8 |
| 7.5°  | 3275.0 | 3262.0 | 3230.0 | 3148.1 | 3016.2 | 2861.3 | 2669.4 | 2460.5 | 2220.6 | 2143.7 | 1977.8 |
| 10°   | 3722.7 | 3691.8 | 3660.8 | 3559.8 | 3401.9 | 3225.0 | 2967.2 | 2673.4 | 2368.6 | 2263.6 | 2032.8 |
| 12.5° | 4159.5 | 4171.5 | 4104.5 | 3996.6 | 3802.7 | 3575.8 | 3269.0 | 2920.2 | 2521.5 | 2389.5 | 2097.7 |
| 15°   | 4677.1 | 4645.2 | 4581.2 | 4421.3 | 4205.4 | 3941.6 | 3591.8 | 3179.1 | 2694.4 | 2534.5 | 2174.7 |
| 17.5° | 5130.9 | 5106.9 | 5051.9 | 4883.0 | 4640.2 | 4318.4 | 3910.6 | 3447.9 | 2882.2 | 2698.4 | 2266.6 |
| 20°   | 5562.6 | 5548.6 | 5475.7 | 5316.8 | 5093.9 | 4726.1 | 4282.4 | 3764.7 | 3100.1 | 2894.2 | 2374.6 |
| 22.5° | 6013.3 | 5996.3 | 5908.4 | 5736.5 | 5497.6 | 5161.9 | 4667.2 | 4088.5 | 3372.9 | 3117.1 | 2501.5 |
| 25°   | 6417.1 | 6443.1 | 6318.1 | 6155.2 | 5898.4 | 5551.6 | 5078.9 | 4441.3 | 3637.8 | 3358.0 | 2668.4 |
| 27.5° | 7053.7 | 6978.7 | 6823.8 | 6582.0 | 6298.2 | 5964.4 | 5479.7 | 4806.1 | 3951.6 | 3636.8 | 2837.3 |
| 30°   | 7729.3 | 7684.3 | 7491.4 | 7111.7 | 6668.9 | 6298.2 | 5856.4 | 5234.8 | 4291.4 | 3964.6 | 3072.1 |
| 32.5° | 8295.9 | 8273.0 | 8083.1 | 7719.3 | 7173.6 | 6628.0 | 6233.2 | 5655.6 | 4678.1 | 4329.4 | 3361.0 |
| 35°   | 8659.7 | 8623.7 | 8488.8 | 8212.0 | 7692.3 | 7052.7 | 6620.0 | 6123.3 | 5112.9 | 4754.1 | 3694.7 |
| 37.5° | 8820.6 | 8775.7 | 8635.7 | 8425.9 | 8061.1 | 7463.5 | 6963.8 | 6563.0 | 5573.6 | 5186.8 | 4011.6 |
| 40°   | 8681.7 | 8665.7 | 8564.8 | 8366.9 | 8203.0 | 7786.3 | 7285.6 | 6977.7 | 6068.3 | 5672.5 | 4461.3 |
| 42.5° | 8247.0 | 8218.0 | 8210.0 | 8121.1 | 8104.1 | 7921.2 | 7570.4 | 7365.5 | 6608.0 | 6202.2 | 4938.0 |
| 45°   | 7653.3 | 7636.3 | 7710.3 | 7750.3 | 7854.2 | 7898.2 | 7771.3 | 7737.3 | 7152.6 | 6744.9 | 5488.7 |
| 47.5° | 6948.8 | 6937.8 | 7086.7 | 7253.6 | 7524.4 | 7740.3 | 7834.2 | 8025.1 | 7683.3 | 7336.5 | 6035.3 |
| 50°   | 5784.5 | 5729.5 | 6192.2 | 6613.0 | 7058.7 | 7514.4 | 7774.3 | 8255.0 | 8234.0 | 7909.2 | 6589.0 |
| 52.5° | 4470.3 | 4449.3 | 5020.9 | 5734.5 | 6517.0 | 7135.7 | 7627.4 | 8382.9 | 8679.7 | 8420.9 | 7168.6 |
| 55°   | 3281.0 | 3297.0 | 3802.7 | 4689.1 | 5640.6 | 6578.0 | 7408.5 | 8414.9 | 9125.4 | 8971.5 | 7713.3 |
| 57.5° | 2395.5 | 2452.5 | 2832.3 | 3585.8 | 4638.2 | 5801.5 | 7094.7 | 8406.9 | 9465.2 | 9416.3 | 8154.0 |
| 60°   | 1795.9 | 1794.9 | 2149.7 | 2654.4 | 3561.8 | 4891.0 | 6587.0 | 8383.9 | 9662.1 | 9717.1 | 8371.9 |
| 61°   | 1629.0 | 1646.0 | 1904.8 | 2330.6 | 3255.0 | 4453.3 | 6333.1 | 8365.9 | 9679.1 | 9769.0 | 8392.9 |
| 62.5° | 1410.1 | 1405.1 | 1608.0 | 1947.8 | 2695.4 | 3804.7 | 5879.4 | 8311.9 | 9659.1 | 9744.1 | 8356.9 |
| 65°   | 1135.3 | 1140.3 | 1277.2 | 1473.1 | 2019.8 | 2833.3 | 4932.0 | 7983.1 | 9339.3 | 9401.3 | 8119.1 |
| 67.5° | 937.4  | 949.4  | 1040.4 | 1169.3 | 1498.1 | 2011.8 | 3774.7 | 7316.5 | 8716.7 | 8648.7 | 7595.4 |
| 70°   | 767.5  | 780.5  | 850.5  | 936.4  | 1143.3 | 1472.1 | 2772.3 | 6135.3 | 7639.3 | 7452.5 | 6645.9 |
| 72.5° | 621.6  | 621.6  | 680.6  | 758.5  | 876.5  | 1058.4 | 1916.8 | 4708.1 | 6257.2 | 6037.3 | 5376.7 |
| 75°   | 493.7  | 491.7  | 533.7  | 572.7  | 649.6  | 773.5  | 1311.2 | 3238.0 | 4692.1 | 4443.3 | 3830.7 |
| 77.5° | 340.8  | 345.8  | 382.8  | 421.7  | 459.7  | 537.7  | 870.5  | 1991.8 | 3030.2 | 2824.3 | 2412.5 |
| 80°   | 251.8  | 253.8  | 274.8  | 295.8  | 291.8  | 340.8  | 548.7  | 1014.4 | 1686.0 | 1682.0 | 1369.2 |
| 82.5° | 182.9  | 187.9  | 195.9  | 207.9  | 201.9  | 222.9  | 329.8  | 508.7  | 892.5  | 887.5  | 735.6  |
| 85°   | 116.9  | 115.9  | 115.9  | 122.9  | 121.9  | 133.9  | 178.9  | 272.8  | 381.8  | 396.8  | 357.8  |
| 87.5° | 42.0   | 44.0   | 51.0   | 62.0   | 58.0   | 55.0   | 54.0   | 72.0   | 65.0   | 61.0   | 58.0   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 | 1835.9 |
| 2.5°  | 1843.9 | 1804.9 | 1723.9 | 1644.0 | 1583.0 | 1513.1 | 1468.1 | 1432.1 | 1390.2 | 1377.2 | 1403.1 |
| 5°    | 1850.9 | 1769.9 | 1621.0 | 1476.1 | 1358.2 | 1266.2 | 1178.3 | 1143.3 | 1086.3 | 1070.3 | 1069.3 |
| 7.5°  | 1861.9 | 1741.9 | 1521.1 | 1327.2 | 1175.3 | 1052.4 | 970.4  | 920.4  | 886.5  | 874.5  | 884.5  |
| 10°   | 1874.9 | 1716.0 | 1426.1 | 1187.3 | 1015.4 | 909.4  | 830.5  | 785.5  | 764.5  | 754.5  | 751.5  |
| 12.5° | 1900.8 | 1699.0 | 1353.2 | 1076.3 | 898.5  | 797.5  | 734.6  | 697.6  | 674.6  | 669.6  | 664.6  |
| 15°   | 1929.8 | 1687.0 | 1276.2 | 977.4  | 805.5  | 711.6  | 655.6  | 628.6  | 609.6  | 600.6  | 600.6  |
| 17.5° | 1968.8 | 1686.0 | 1201.3 | 885.5  | 729.6  | 643.6  | 594.6  | 572.7  | 559.7  | 554.7  | 553.7  |
| 20°   | 2021.8 | 1692.0 | 1140.3 | 820.5  | 665.6  | 586.6  | 549.7  | 530.7  | 522.7  | 517.7  | 517.7  |
| 22.5° | 2096.7 | 1712.0 | 1088.3 | 758.5  | 611.6  | 541.7  | 508.7  | 497.7  | 490.7  | 485.7  | 485.7  |
| 25°   | 2200.7 | 1756.9 | 1050.4 | 707.6  | 566.7  | 504.7  | 477.7  | 465.7  | 460.7  | 458.7  | 457.7  |
| 27.5° | 2313.6 | 1811.9 | 1034.4 | 671.6  | 526.7  | 472.7  | 449.7  | 437.7  | 433.7  | 431.7  | 431.7  |
| 30°   | 2462.5 | 1890.8 | 1023.4 | 645.6  | 495.7  | 443.7  | 422.7  | 409.8  | 404.8  | 404.8  | 403.8  |
| 32.5° | 2658.4 | 2020.8 | 1044.4 | 625.6  | 474.7  | 419.7  | 396.8  | 385.8  | 380.8  | 379.8  | 378.8  |
| 35°   | 2919.2 | 2204.7 | 1094.3 | 618.6  | 453.7  | 396.8  | 373.8  | 363.8  | 358.8  | 357.8  | 355.8  |
| 37.5° | 3152.1 | 2354.6 | 1159.3 | 615.6  | 434.7  | 376.8  | 354.8  | 343.8  | 337.8  | 335.8  | 336.8  |
| 40°   | 3491.9 | 2593.4 | 1246.2 | 621.6  | 417.7  | 356.8  | 336.8  | 325.8  | 319.8  | 317.8  | 316.8  |
| 42.5° | 3871.6 | 2895.2 | 1379.2 | 645.6  | 406.8  | 338.8  | 320.8  | 308.8  | 303.8  | 301.8  | 300.8  |
| 45°   | 4321.4 | 3250.0 | 1557.1 | 679.6  | 398.8  | 324.8  | 303.8  | 293.8  | 288.8  | 285.8  | 285.8  |
| 47.5° | 4792.1 | 3623.8 | 1740.9 | 722.6  | 392.8  | 313.8  | 288.8  | 278.8  | 272.8  | 269.8  | 267.8  |
| 50°   | 5312.8 | 4005.6 | 1955.8 | 769.5  | 387.8  | 302.8  | 273.8  | 260.8  | 254.8  | 248.8  | 248.8  |
| 52.5° | 5816.5 | 4442.3 | 2178.7 | 823.5  | 383.8  | 284.8  | 256.8  | 242.9  | 232.9  | 226.9  | 225.9  |
| 55°   | 6298.2 | 4840.1 | 2390.5 | 873.5  | 379.8  | 269.8  | 237.9  | 220.9  | 211.9  | 207.9  | 208.9  |
| 57.5° | 6675.9 | 5122.9 | 2575.4 | 915.4  | 370.8  | 252.8  | 216.9  | 201.9  | 194.9  | 197.9  | 194.9  |
| 60°   | 6774.9 | 5085.9 | 2614.4 | 923.4  | 353.8  | 231.9  | 195.9  | 186.9  | 184.9  | 179.9  | 179.9  |
| 61°   | 6701.9 | 4946.0 | 2546.4 | 911.4  | 345.8  | 221.9  | 189.9  | 182.9  | 179.9  | 174.9  | 174.9  |
| 62.5° | 6509.0 | 4587.2 | 2356.6 | 871.5  | 329.8  | 207.9  | 180.9  | 175.9  | 171.9  | 166.9  | 167.9  |
| 65°   | 6066.3 | 3852.7 | 1848.9 | 753.5  | 295.8  | 187.9  | 165.9  | 162.9  | 157.9  | 153.9  | 150.9  |
| 67.5° | 5409.7 | 3115.1 | 1328.2 | 603.6  | 259.8  | 169.9  | 148.9  | 144.9  | 139.9  | 134.9  | 132.9  |
| 70°   | 4664.2 | 2411.5 | 900.5  | 465.7  | 222.9  | 149.9  | 130.9  | 123.9  | 119.9  | 115.9  | 113.9  |
| 72.5° | 3733.7 | 1813.9 | 568.7  | 343.8  | 184.9  | 125.9  | 106.9  | 102.9  | 98.9   | 95.9   | 94.9   |
| 75°   | 2737.3 | 1267.2 | 379.8  | 256.8  | 148.9  | 101.9  | 85.9   | 78.0   | 76.0   | 74.0   | 71.0   |
| 77.5° | 1633.0 | 711.6  | 245.9  | 186.9  | 117.9  | 80.0   | 66.0   | 60.0   | 59.0   | 56.0   | 56.0   |
| 80°   | 859.5  | 377.8  | 161.9  | 128.9  | 83.9   | 61.0   | 52.0   | 48.0   | 44.0   | 35.0   | 29.0   |
| 82.5° | 486.7  | 204.9  | 105.9  | 81.0   | 56.0   | 45.0   | 39.0   | 36.0   | 30.0   | 9.0    | 5.0    |
| 85°   | 242.9  | 103.9  | 51.0   | 41.0   | 27.0   | 18.0   | 19.0   | 15.0   | 7.0    | 1.0    | 0.0    |
| 87.5° | 44.0   | 15.0   | 9.0    | 9.0    | 7.0    | 5.0    | 4.0    | 2.0    | 1.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP2-2501-321-5

Test Date: 04/10/2025

Luminaire Tested: GKO-PB1E-750-U-T4W

Data in this report applies to families of products including GKO-PB1E-750-U-T4W

### Test Information

Test Method: LM-79-2019  
 Report Number: SP2-2501-321-5  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP2 - 165CM SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/10/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GKO-PB1E-750-U-T4W**  
 Description: Gekko Wedge Wall Pack Fixture 1 SQ w/ T4W distribution

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 5105     | CRI (Ra): | 72.2 |      |       |
| CIE u':                   | 0.2079   | R1:       | 68.8 | R9:  | -38.2 |
| CIE v':                   | 0.4868   | R2:       | 78.3 | R10: | 48.2  |
| Duv:                      | 0.0035   | R3:       | 84.9 | R11: | 68.1  |
| CIE x:                    | 0.3428   | R4:       | 71.7 | R12: | 42.9  |
| CIE y:                    | 0.3567   | R5:       | 69.8 | R13: | 70.6  |
| CIE z:                    | 0.3005   | R6:       | 69.8 | R14: | 91.6  |
| Peak Wavelength (nm):     | 451      | R7:       | 81.2 | R15: | 61.7  |
| Dominant Wavelength (nm): | 567      | R8:       | 53.5 |      |       |
| Purity:                   | 9.884628 |           |      |      |       |
| Rf:                       | 74.2     |           |      |      |       |
| Rg:                       | 92.7     |           |      |      |       |



### Test Conditions

Stabilization Time: 30M  
 Operation Time: 1H 30M  
 Sphere Temperature (°C): 25.0

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN2187                | 1/6/2025         | 7/6/2025             |
| Power Meter                    | INXT2011002           | 1/21/2025        | 1/21/2026            |
| AC Power Source                | IN0458                | 10/22/2024       | 10/22/2025           |
| DC Power Source                | IN0212                | 10/22/2024       | 10/22/2025           |
| Sphere Thermometer             | IN4036B               | 10/22/2024       | 10/22/2025           |
| Room Thermometer               | IN0046                | 10/22/2024       | 10/22/2025           |

REPORT NUMBER: SP2-2501-321-5

**CIE 1931 Chromaticity Diagram**



**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 4-step quadrangle

REPORT NUMBER: SP2-2501-321-5

### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 134                         | NR               | 620       | 390                         | NR               | 750       | 10                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 165                         | NR               | 625       | 354                         | NR               | 755       | 9                           | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 218                         | NR               | 630       | 319                         | NR               | 760       | 8                           | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 281                         | NR               | 635       | 285                         | NR               | 765       | 7                           | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 343                         | NR               | 640       | 254                         | NR               | 770       | 6                           | NR               | 900       | 0                           | NR               |
| 385       | 1                           | NR               | 515       | 400                         | NR               | 645       | 224                         | NR               | 775       | 5                           | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 444                         | NR               | 650       | 197                         | NR               | 780       | 4                           | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 477                         | NR               | 655       | 173                         | NR               | 785       | 4                           | NR               | 915       | 0                           | NR               |
| 400       | 6                           | NR               | 530       | 501                         | NR               | 660       | 150                         | NR               | 790       | 3                           | NR               | 920       | 0                           | NR               |
| 405       | 9                           | NR               | 535       | 520                         | NR               | 665       | 131                         | NR               | 795       | 3                           | NR               | 925       | 0                           | NR               |
| 410       | 14                          | NR               | 540       | 534                         | NR               | 670       | 113                         | NR               | 800       | 2                           | NR               | 930       | 0                           | NR               |
| 415       | 26                          | NR               | 545       | 547                         | NR               | 675       | 98                          | NR               | 805       | 2                           | NR               | 935       | 0                           | NR               |
| 420       | 50                          | NR               | 550       | 561                         | NR               | 680       | 85                          | NR               | 810       | 2                           | NR               | 940       | 0                           | NR               |
| 425       | 95                          | NR               | 555       | 574                         | NR               | 685       | 73                          | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 168                         | NR               | 560       | 586                         | NR               | 690       | 63                          | NR               | 820       | 1                           | NR               | 950       | 0                           | NR               |
| 435       | 284                         | NR               | 565       | 596                         | NR               | 695       | 54                          | NR               | 825       | 1                           | NR               | 955       | 0                           | NR               |
| 440       | 452                         | NR               | 570       | 604                         | NR               | 700       | 46                          | NR               | 830       | 1                           | NR               | 960       | 0                           | NR               |
| 445       | 705                         | NR               | 575       | 606                         | NR               | 705       | 40                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 980                         | NR               | 580       | 603                         | NR               | 710       | 34                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 869                         | NR               | 585       | 592                         | NR               | 715       | 29                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 531                         | NR               | 590       | 577                         | NR               | 720       | 25                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 372                         | NR               | 595       | 554                         | NR               | 725       | 22                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 268                         | NR               | 600       | 527                         | NR               | 730       | 19                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 174                         | NR               | 605       | 497                         | NR               | 735       | 16                          | NR               | 865       | 0                           | NR               | 995       | 0                           | NR               |
| 480       | 135                         | NR               | 610       | 462                         | NR               | 740       | 14                          | NR               | 870       | 0                           | NR               | 1000      | 0                           | NR               |
| 485       | 126                         | NR               | 615       | 428                         | NR               | 745       | 12                          | NR               | 875       | 0                           | NR               |           |                             |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.82

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 134                      | NR            | 620    | 390                      | NR            | 750    | 10                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 165                      | NR            | 625    | 354                      | NR            | 755    | 9                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 218                      | NR            | 630    | 319                      | NR            | 760    | 8                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 281                      | NR            | 635    | 285                      | NR            | 765    | 7                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 343                      | NR            | 640    | 254                      | NR            | 770    | 6                        | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 400                      | NR            | 645    | 224                      | NR            | 775    | 5                        | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 444                      | NR            | 650    | 197                      | NR            | 780    | 4                        | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 477                      | NR            | 655    | 173                      | NR            | 785    | 4                        | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 501                      | NR            | 660    | 150                      | NR            | 790    | 3                        | NR            | 920    | 0                        | NR            |
| 405    | 9                        | NR            | 535    | 520                      | NR            | 665    | 131                      | NR            | 795    | 3                        | NR            | 925    | 0                        | NR            |
| 410    | 14                       | NR            | 540    | 534                      | NR            | 670    | 113                      | NR            | 800    | 2                        | NR            | 930    | 0                        | NR            |
| 415    | 26                       | NR            | 545    | 547                      | NR            | 675    | 98                       | NR            | 805    | 2                        | NR            | 935    | 0                        | NR            |
| 420    | 50                       | NR            | 550    | 561                      | NR            | 680    | 85                       | NR            | 810    | 2                        | NR            | 940    | 0                        | NR            |
| 425    | 95                       | NR            | 555    | 574                      | NR            | 685    | 73                       | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 168                      | NR            | 560    | 586                      | NR            | 690    | 63                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 284                      | NR            | 565    | 596                      | NR            | 695    | 54                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 452                      | NR            | 570    | 604                      | NR            | 700    | 46                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 705                      | NR            | 575    | 606                      | NR            | 705    | 40                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 980                      | NR            | 580    | 603                      | NR            | 710    | 34                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 869                      | NR            | 585    | 592                      | NR            | 715    | 29                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 531                      | NR            | 590    | 577                      | NR            | 720    | 25                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 372                      | NR            | 595    | 554                      | NR            | 725    | 22                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 268                      | NR            | 600    | 527                      | NR            | 730    | 19                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 174                      | NR            | 605    | 497                      | NR            | 735    | 16                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 135                      | NR            | 610    | 462                      | NR            | 740    | 14                       | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 126                      | NR            | 615    | 428                      | NR            | 745    | 12                       | NR            | 875    | 0                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.75

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 134                         | NR               | 620       | 390                         | NR               | 750       | 10                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 165                         | NR               | 625       | 354                         | NR               | 755       | 9                           | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 218                         | NR               | 630       | 319                         | NR               | 760       | 8                           | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 281                         | NR               | 635       | 285                         | NR               | 765       | 7                           | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 343                         | NR               | 640       | 254                         | NR               | 770       | 6                           | NR               | 900       | 0                           | NR               |
| 385       | 1                           | NR               | 515       | 400                         | NR               | 645       | 224                         | NR               | 775       | 5                           | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 444                         | NR               | 650       | 197                         | NR               | 780       | 4                           | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 477                         | NR               | 655       | 173                         | NR               | 785       | 4                           | NR               | 915       | 0                           | NR               |
| 400       | 6                           | NR               | 530       | 501                         | NR               | 660       | 150                         | NR               | 790       | 3                           | NR               | 920       | 0                           | NR               |
| 405       | 9                           | NR               | 535       | 520                         | NR               | 665       | 131                         | NR               | 795       | 3                           | NR               | 925       | 0                           | NR               |
| 410       | 14                          | NR               | 540       | 534                         | NR               | 670       | 113                         | NR               | 800       | 2                           | NR               | 930       | 0                           | NR               |
| 415       | 26                          | NR               | 545       | 547                         | NR               | 675       | 98                          | NR               | 805       | 2                           | NR               | 935       | 0                           | NR               |
| 420       | 50                          | NR               | 550       | 561                         | NR               | 680       | 85                          | NR               | 810       | 2                           | NR               | 940       | 0                           | NR               |
| 425       | 95                          | NR               | 555       | 574                         | NR               | 685       | 73                          | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 168                         | NR               | 560       | 586                         | NR               | 690       | 63                          | NR               | 820       | 1                           | NR               | 950       | 0                           | NR               |
| 435       | 284                         | NR               | 565       | 596                         | NR               | 695       | 54                          | NR               | 825       | 1                           | NR               | 955       | 0                           | NR               |
| 440       | 452                         | NR               | 570       | 604                         | NR               | 700       | 46                          | NR               | 830       | 1                           | NR               | 960       | 0                           | NR               |
| 445       | 705                         | NR               | 575       | 606                         | NR               | 705       | 40                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 980                         | NR               | 580       | 603                         | NR               | 710       | 34                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 869                         | NR               | 585       | 592                         | NR               | 715       | 29                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 531                         | NR               | 590       | 577                         | NR               | 720       | 25                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 372                         | NR               | 595       | 554                         | NR               | 725       | 22                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 268                         | NR               | 600       | 527                         | NR               | 730       | 19                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 174                         | NR               | 605       | 497                         | NR               | 735       | 16                          | NR               | 865       | 0                           | NR               | 995       | 0                           | NR               |
| 480       | 135                         | NR               | 610       | 462                         | NR               | 740       | 14                          | NR               | 870       | 0                           | NR               | 1000      | 0                           | NR               |
| 485       | 126                         | NR               | 615       | 428                         | NR               | 745       | 12                          | NR               | 875       | 0                           | NR               |           |                             |                  |

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TM-30-18

### Summary

$R_f = 74.2$   
 $R_g = 92.7$   
 $\text{CIE } R_a = 72.2$   
 $R_g = -38.2$



### Color Vector Graphics



**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 63 | CES51 = 89 | CES76 = 51 |
| CES02 = 59 | CES27 = 89 | CES52 = 89 | CES77 = 68 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 69 | CES54 = 84 | CES79 = 80 |
| CES05 = 46 | CES30 = 88 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 72 | CES56 = 74 | CES81 = 79 |
| CES07 = 38 | CES32 = 63 | CES57 = 73 | CES82 = 91 |
| CES08 = 38 | CES33 = 82 | CES58 = 74 | CES83 = 90 |
| CES09 = 29 | CES34 = 70 | CES59 = 86 | CES84 = 85 |
| CES10 = 72 | CES35 = 83 | CES60 = 88 | CES85 = 78 |
| CES11 = 56 | CES36 = 88 | CES61 = 82 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 81 | CES87 = 77 |
| CES13 = 41 | CES38 = 98 | CES63 = 73 | CES88 = 81 |
| CES14 = 74 | CES39 = 97 | CES64 = 64 | CES89 = 73 |
| CES15 = 70 | CES40 = 91 | CES65 = 61 | CES90 = 80 |
| CES16 = 46 | CES41 = 96 | CES66 = 56 | CES91 = 72 |
| CES17 = 49 | CES42 = 80 | CES67 = 54 | CES92 = 58 |
| CES18 = 55 | CES43 = 79 | CES68 = 64 | CES93 = 75 |
| CES19 = 71 | CES44 = 99 | CES69 = 73 | CES94 = 53 |
| CES20 = 63 | CES45 = 87 | CES70 = 56 | CES95 = 64 |
| CES21 = 85 | CES46 = 85 | CES71 = 47 | CES96 = 76 |
| CES22 = 77 | CES47 = 90 | CES72 = 82 | CES97 = 86 |
| CES23 = 91 | CES48 = 80 | CES73 = 47 | CES98 = 76 |
| CES24 = 90 | CES49 = 83 | CES74 = 90 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 50 |            |



### Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)