

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P438639

Luminaire Tested: **IST-SA1E-722-U-SL4-HSS**

Issue Date: 12/10/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P438639  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/10/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: IST-SA1E-722-U-SL4-HSS  
Description: IMPACT ELITE LED TRAPEZOID LUMINAIRE  
(1) 70 CRI, 2200K, 1050mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

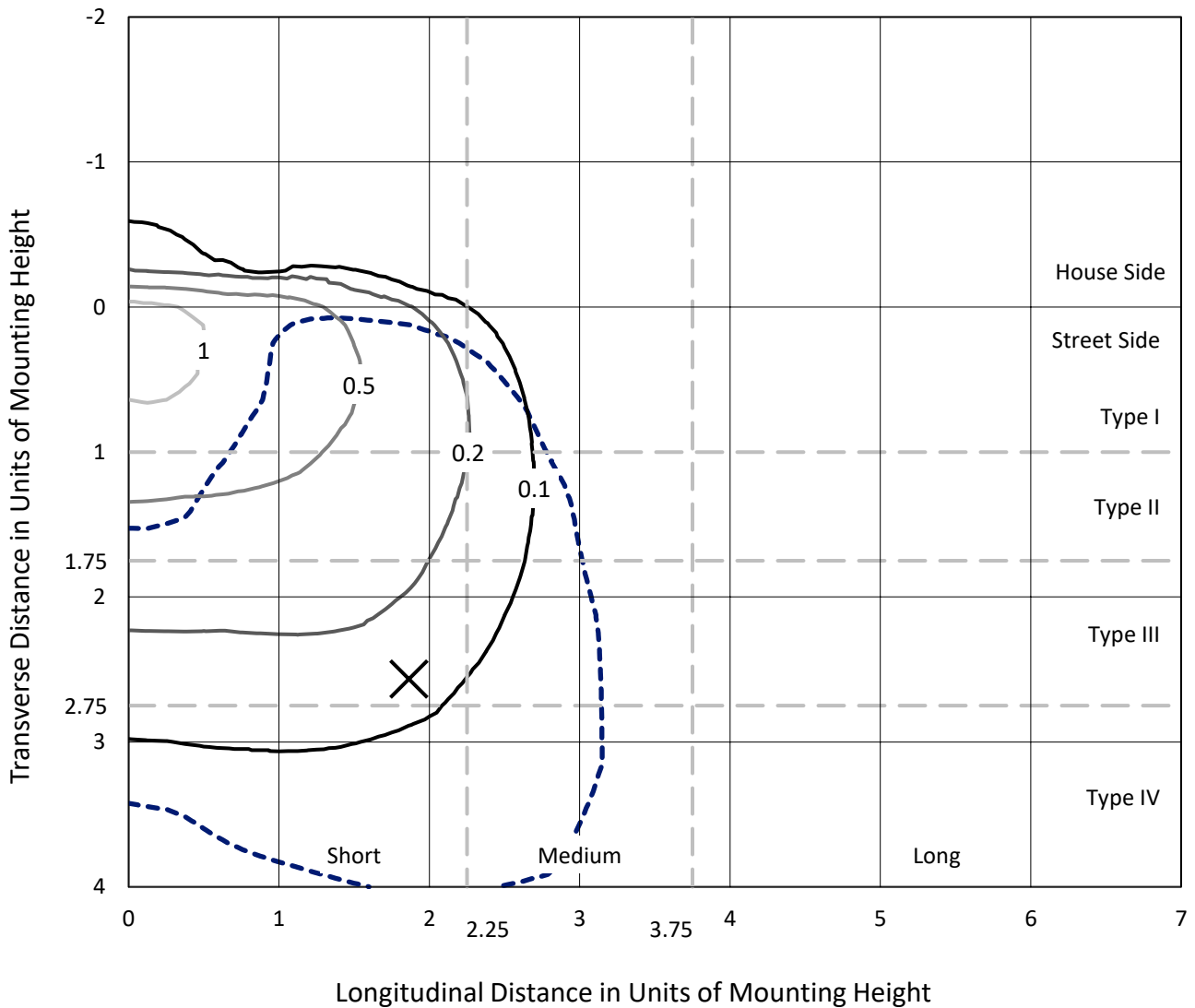
Lumens per Lamp: N/A  
Luminaire Lumens: 4258 lumens  
Efficiency: N/A  
Efficacy: 73.2 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2  
  
Input Watts (W): 58.2  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
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

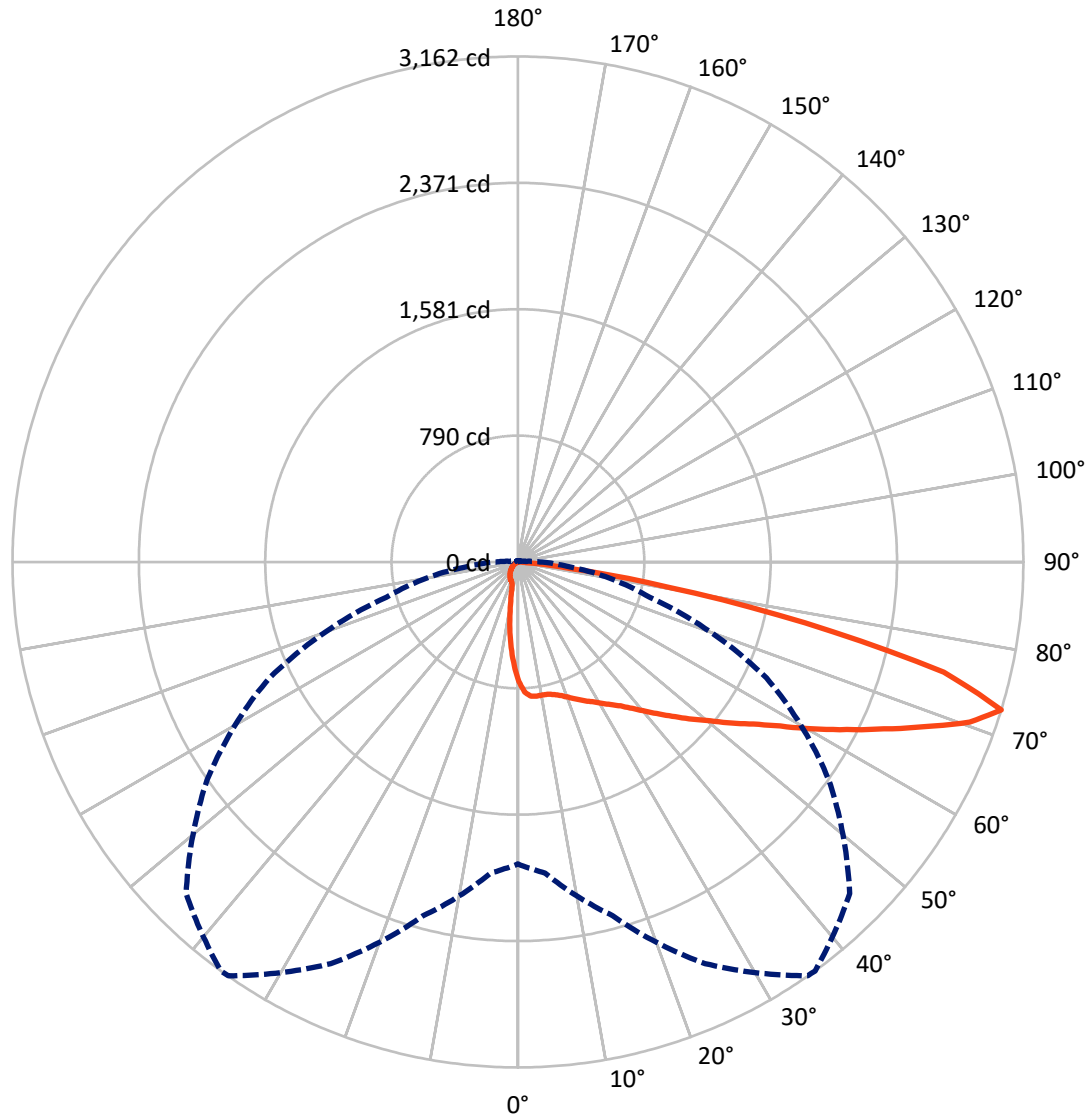
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.3 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 36-Deg Lateral    - - - Horizontal Cone Through 72.5-Deg Vertical

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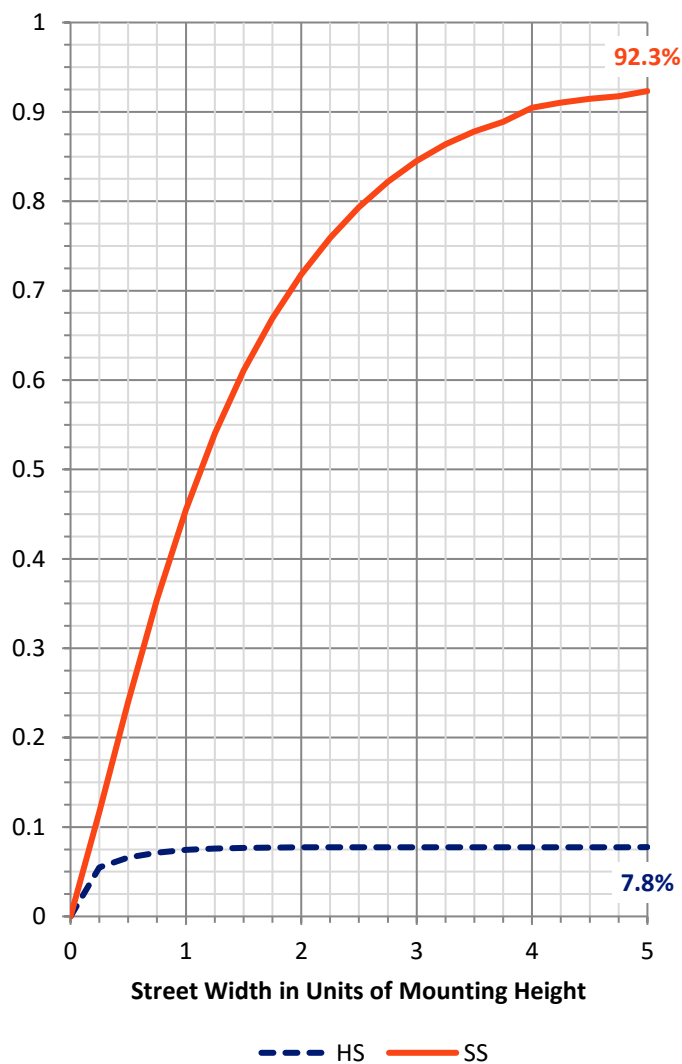
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 332.2    | 0.0    | 332.2  |
|                    | % Fixture | 7.8      | 0.0    | 7.8    |
| <b>Street Side</b> | Lumens    | 3925.8   | 0.0    | 3925.8 |
|                    | % Fixture | 92.2     | 0.0    | 92.2   |
| <b>Total</b>       | Lumens    | 4258.0   | 0.0    | 4258.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 63.9   | 1.5       |
| 10°-20°   | 160.3  | 3.8       |
| 20°-30°   | 261.8  | 6.1       |
| 30°-40°   | 398.1  | 9.3       |
| 40°-50°   | 608.7  | 14.3      |
| 50°-60°   | 865.6  | 20.3      |
| 60°-70°   | 1097.6 | 25.8      |
| 70°-80°   | 751.6  | 17.7      |
| 80°-90°   | 50.4   | 1.2       |
| 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°    | 4258.0 | 100.0     |
| 0°-180°   | 4258.0 | 100.0     |

**Coefficient of Utilization**



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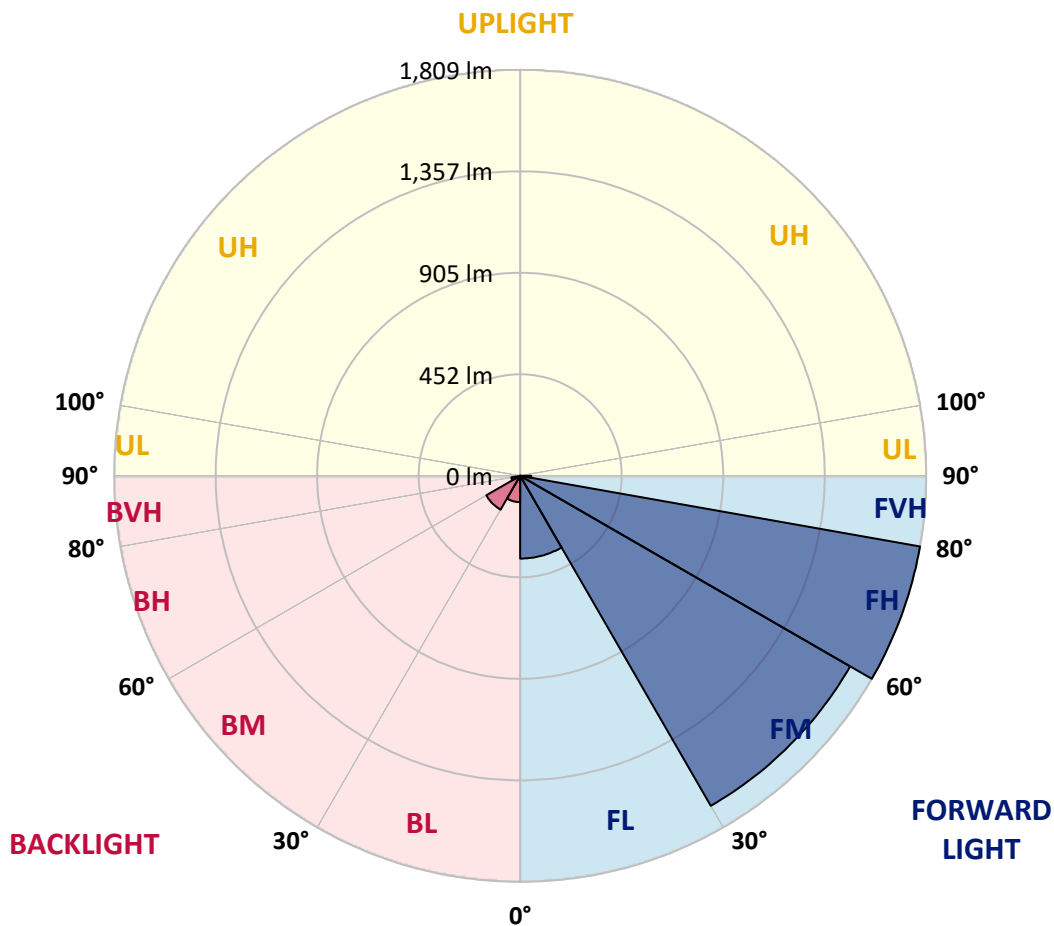
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 368.8  | 8.7       |                         |      |         |
| FM (30°-60°)   | 1698.2 | 39.9      |                         |      |         |
| FH (60°-80°)   | 1809.2 | 42.5      |                         |      | G2/5000 |
| FVH (80°-90°)  | 49.6   | 1.2       |                         |      | G1/100  |
| BL (0°-30°)    | 117.2  | 2.8       | B1/500                  |      |         |
| BM (30°-60°)   | 174.2  | 4.1       | B0/220                  |      |         |
| BH (60°-80°)   | 40.0   | 0.9       | B0/110                  |      | G0/110  |
| BVH (80°-90°)  | 0.7    | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 36°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 747.8  | 747.8  | 747.8  | 747.8  | 747.8  | 747.8  | 747.8  | 747.8  | 747.8  | 747.8  | 747.8  |
| 2.5°  | 837.7  | 832.1  | 828.4  | 824.6  | 813.4  | 815.2  | 804.0  | 792.7  | 775.9  | 768.4  | 757.1  |
| 5°    | 858.3  | 856.5  | 854.6  | 849.0  | 839.6  | 843.3  | 832.1  | 820.9  | 796.5  | 774.0  | 749.6  |
| 7.5°  | 854.6  | 858.3  | 856.5  | 852.7  | 845.2  | 847.1  | 837.7  | 826.5  | 805.9  | 775.9  | 742.1  |
| 10°   | 847.1  | 849.0  | 849.0  | 847.1  | 845.2  | 845.2  | 837.7  | 828.4  | 809.6  | 783.4  | 740.3  |
| 12.5° | 832.1  | 835.9  | 841.5  | 845.2  | 847.1  | 849.0  | 843.3  | 835.9  | 819.0  | 790.9  | 745.9  |
| 15°   | 826.5  | 830.2  | 841.5  | 852.7  | 858.3  | 860.2  | 854.6  | 845.2  | 830.2  | 805.9  | 755.3  |
| 17.5° | 826.5  | 830.2  | 849.0  | 865.8  | 877.1  | 879.0  | 871.5  | 862.1  | 843.3  | 819.0  | 766.5  |
| 20°   | 837.7  | 841.5  | 864.0  | 893.9  | 899.6  | 903.3  | 892.1  | 879.0  | 858.3  | 834.0  | 779.6  |
| 22.5° | 856.5  | 862.1  | 890.2  | 918.3  | 929.6  | 931.4  | 918.3  | 893.9  | 875.2  | 850.8  | 790.9  |
| 25°   | 888.3  | 901.4  | 927.7  | 957.7  | 959.5  | 961.4  | 940.8  | 916.4  | 893.9  | 869.6  | 804.0  |
| 27.5° | 933.3  | 944.5  | 967.0  | 1000.8 | 989.5  | 989.5  | 972.7  | 940.8  | 918.3  | 895.8  | 826.5  |
| 30°   | 991.4  | 998.9  | 1025.1 | 1038.3 | 1023.3 | 1025.1 | 1004.5 | 974.5  | 955.8  | 933.3  | 860.2  |
| 32.5° | 1045.8 | 1051.4 | 1079.5 | 1081.4 | 1064.5 | 1062.6 | 1047.6 | 1012.0 | 997.0  | 989.5  | 907.1  |
| 35°   | 1096.4 | 1103.8 | 1126.3 | 1124.5 | 1107.6 | 1105.7 | 1098.2 | 1066.4 | 1066.4 | 1073.9 | 976.4  |
| 37.5° | 1133.8 | 1152.6 | 1180.7 | 1173.2 | 1161.9 | 1161.9 | 1156.3 | 1132.0 | 1150.7 | 1178.8 | 1068.2 |
| 40°   | 1182.6 | 1193.8 | 1231.3 | 1225.7 | 1227.5 | 1227.5 | 1229.4 | 1214.4 | 1248.2 | 1295.0 | 1175.1 |
| 42.5° | 1208.8 | 1231.3 | 1276.3 | 1283.8 | 1300.6 | 1300.6 | 1315.6 | 1311.9 | 1375.6 | 1435.6 | 1298.8 |
| 45°   | 1250.0 | 1274.4 | 1323.1 | 1351.2 | 1371.8 | 1381.2 | 1407.5 | 1428.1 | 1518.0 | 1593.0 | 1429.9 |
| 47.5° | 1302.5 | 1323.1 | 1364.3 | 1416.8 | 1454.3 | 1469.3 | 1521.8 | 1555.5 | 1675.5 | 1752.3 | 1553.6 |
| 50°   | 1373.7 | 1377.5 | 1407.5 | 1486.2 | 1551.8 | 1561.1 | 1643.6 | 1699.8 | 1834.7 | 1906.0 | 1641.7 |
| 52.5° | 1450.6 | 1443.1 | 1459.9 | 1566.8 | 1658.6 | 1675.5 | 1769.2 | 1855.4 | 1990.3 | 2005.3 | 1677.3 |
| 55°   | 1510.5 | 1510.5 | 1523.6 | 1654.8 | 1778.5 | 1787.9 | 1919.1 | 2010.9 | 2132.7 | 2063.4 | 1699.8 |
| 57.5° | 1587.4 | 1579.9 | 1600.5 | 1744.8 | 1928.5 | 1936.0 | 2087.8 | 2159.0 | 2211.4 | 2100.9 | 1696.1 |
| 60°   | 1643.6 | 1653.0 | 1684.8 | 1861.0 | 2084.0 | 2117.7 | 2245.2 | 2267.7 | 2293.9 | 2114.0 | 1684.8 |
| 62.5° | 1722.3 | 1720.4 | 1782.3 | 1990.3 | 2286.4 | 2308.9 | 2397.0 | 2359.5 | 2357.6 | 2136.5 | 1669.8 |
| 65°   | 1787.9 | 1802.9 | 1896.6 | 2145.9 | 2501.9 | 2516.9 | 2546.9 | 2498.2 | 2445.7 | 2160.8 | 1538.6 |
| 67.5° | 1889.1 | 1919.1 | 2037.2 | 2350.1 | 2732.4 | 2749.3 | 2775.6 | 2668.7 | 2470.1 | 1988.4 | 1281.9 |
| 70°   | 2003.4 | 2042.8 | 2233.9 | 2621.9 | 2979.8 | 2998.6 | 3004.2 | 2685.6 | 2237.7 | 1561.1 | 869.6  |
| 72.5° | 1889.1 | 1952.8 | 2290.2 | 2771.8 | 3159.7 | 3161.6 | 2934.8 | 2372.6 | 1714.8 | 852.7  | 307.4  |
| 75°   | 1216.3 | 1296.9 | 1896.6 | 2458.8 | 2721.2 | 2751.2 | 2301.4 | 1658.6 | 800.2  | 191.2  | 86.2   |
| 77.5° | 412.3  | 440.4  | 931.4  | 1551.8 | 1825.4 | 1836.6 | 1514.3 | 839.6  | 253.0  | 76.8   | 46.9   |
| 80°   | 238.0  | 236.1  | 326.1  | 678.4  | 910.8  | 946.4  | 762.8  | 335.5  | 118.1  | 39.4   | 31.9   |
| 82.5° | 56.2   | 58.1   | 170.5  | 247.4  | 361.7  | 326.1  | 161.2  | 202.4  | 54.3   | 22.5   | 28.1   |
| 85°   | 0.0    | 0.0    | 28.1   | 60.0   | 43.1   | 50.6   | 15.0   | 61.8   | 9.4    | 9.4    | 18.7   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 1.9    | 1.9    | 1.9    | 1.9    | 1.9    | 1.9    | 1.9    |
| 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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 CATALOG NUMBER: IST-SA1E-722-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 747.8  | 747.8 | 747.8 | 747.8 | 747.8 | 747.8 | 747.8 | 747.8 | 747.8 | 747.8 | 747.8 |
| 2.5°  | 745.9  | 736.5 | 717.8 | 702.8 | 682.2 | 665.3 | 648.4 | 640.9 | 627.8 | 624.1 | 626.0 |
| 5°    | 734.6  | 719.7 | 684.0 | 648.4 | 609.1 | 571.6 | 532.2 | 509.8 | 500.4 | 483.5 | 479.8 |
| 7.5°  | 721.5  | 699.0 | 648.4 | 590.3 | 522.9 | 468.5 | 414.2 | 376.7 | 343.0 | 329.8 | 324.2 |
| 10°   | 715.9  | 687.8 | 616.6 | 528.5 | 436.7 | 348.6 | 281.1 | 232.4 | 202.4 | 191.2 | 187.4 |
| 12.5° | 715.9  | 682.2 | 586.6 | 468.5 | 346.7 | 245.5 | 183.7 | 155.6 | 146.2 | 144.3 | 142.4 |
| 15°   | 723.4  | 680.3 | 558.5 | 404.8 | 262.4 | 170.5 | 140.6 | 136.8 | 134.9 | 134.9 | 136.8 |
| 17.5° | 727.2  | 676.6 | 528.5 | 343.0 | 193.0 | 136.8 | 131.2 | 131.2 | 131.2 | 131.2 | 131.2 |
| 20°   | 736.5  | 674.7 | 494.8 | 277.4 | 146.2 | 127.4 | 125.6 | 125.6 | 125.6 | 125.6 | 127.4 |
| 22.5° | 738.4  | 674.7 | 453.5 | 213.6 | 129.3 | 121.8 | 119.9 | 119.9 | 119.9 | 121.8 | 121.8 |
| 25°   | 749.6  | 670.9 | 414.2 | 163.0 | 121.8 | 114.3 | 114.3 | 112.4 | 114.3 | 114.3 | 114.3 |
| 27.5° | 764.6  | 672.8 | 365.5 | 134.9 | 114.3 | 108.7 | 106.8 | 106.8 | 106.8 | 106.8 | 106.8 |
| 30°   | 781.5  | 676.6 | 314.8 | 119.9 | 106.8 | 103.1 | 101.2 | 99.3  | 99.3  | 99.3  | 99.3  |
| 32.5° | 813.4  | 680.3 | 260.5 | 108.7 | 99.3  | 95.6  | 93.7  | 91.8  | 91.8  | 91.8  | 91.8  |
| 35°   | 862.1  | 700.9 | 213.6 | 101.2 | 91.8  | 88.1  | 86.2  | 84.3  | 84.3  | 84.3  | 82.5  |
| 37.5° | 927.7  | 732.8 | 168.7 | 93.7  | 84.3  | 80.6  | 78.7  | 76.8  | 75.0  | 75.0  | 75.0  |
| 40°   | 1006.4 | 766.5 | 140.6 | 84.3  | 76.8  | 73.1  | 71.2  | 69.3  | 67.5  | 65.6  | 65.6  |
| 42.5° | 1100.1 | 807.7 | 112.4 | 76.8  | 69.3  | 65.6  | 63.7  | 61.8  | 58.1  | 56.2  | 58.1  |
| 45°   | 1205.1 | 847.1 | 95.6  | 71.2  | 63.7  | 60.0  | 58.1  | 54.3  | 50.6  | 48.7  | 48.7  |
| 47.5° | 1296.9 | 856.5 | 84.3  | 63.7  | 58.1  | 54.3  | 52.5  | 46.9  | 43.1  | 39.4  | 39.4  |
| 50°   | 1358.7 | 839.6 | 75.0  | 58.1  | 52.5  | 50.6  | 46.9  | 39.4  | 33.7  | 31.9  | 30.0  |
| 52.5° | 1366.2 | 794.6 | 65.6  | 52.5  | 48.7  | 45.0  | 39.4  | 33.7  | 28.1  | 24.4  | 24.4  |
| 55°   | 1358.7 | 719.7 | 58.1  | 48.7  | 43.1  | 39.4  | 33.7  | 26.2  | 20.6  | 18.7  | 16.9  |
| 57.5° | 1334.4 | 640.9 | 52.5  | 43.1  | 39.4  | 33.7  | 26.2  | 20.6  | 15.0  | 13.1  | 11.2  |
| 60°   | 1289.4 | 545.4 | 46.9  | 39.4  | 33.7  | 28.1  | 20.6  | 15.0  | 9.4   | 7.5   | 7.5   |
| 62.5° | 1205.1 | 440.4 | 41.2  | 33.7  | 28.1  | 22.5  | 16.9  | 9.4   | 5.6   | 3.7   | 3.7   |
| 65°   | 1038.3 | 329.8 | 35.6  | 28.1  | 22.5  | 18.7  | 11.2  | 5.6   | 1.9   | 0.0   | 0.0   |
| 67.5° | 807.7  | 223.0 | 28.1  | 22.5  | 18.7  | 15.0  | 9.4   | 1.9   | 0.0   | 0.0   | 0.0   |
| 70°   | 476.0  | 118.1 | 22.5  | 16.9  | 15.0  | 11.2  | 5.6   | 1.9   | 0.0   | 0.0   | 0.0   |
| 72.5° | 136.8  | 46.9  | 16.9  | 13.1  | 11.2  | 7.5   | 3.7   | 1.9   | 0.0   | 0.0   | 0.0   |
| 75°   | 56.2   | 28.1  | 11.2  | 9.4   | 9.4   | 5.6   | 1.9   | 1.9   | 0.0   | 0.0   | 0.0   |
| 77.5° | 37.5   | 20.6  | 7.5   | 5.6   | 5.6   | 3.7   | 1.9   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 30.0   | 11.2  | 3.7   | 3.7   | 3.7   | 1.9   | 1.9   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 26.2   | 7.5   | 1.9   | 1.9   | 1.9   | 1.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 13.1   | 3.7   | 1.9   | 1.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 1.9    | 1.9   | 1.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 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   |



Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



**Test Information**

Test Method: LM-79-2008 Report  
 Number: SP1-1908-441-10-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **SA1C-722-U-5WQ**  
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

CCT (K): 2237  
 CIE u': 0.2876  
 CIE v': 0.5346  
 Duv: -0.0006  
 CIE x: 0.5005  
 CIE y: 0.4134  
 CIE z: 0.0860  
 Peak Wavelength (nm): 603  
 Dominant Wavelength (nm): 587  
 Purity: 74.5  
 Rf: 69.8  
 Rg: 99.2

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 72.0 |      |       |
| R1:       | 68.9 | R9:  | -17.4 |
| R2:       | 83.0 | R10: | 61.3  |
| R3:       | 95.2 | R11: | 59.8  |
| R4:       | 66.2 | R12: | 50.5  |
| R5:       | 65.9 | R13: | 71.1  |
| R6:       | 76.3 | R14: | 96.9  |
| R7:       | 76.7 |      |       |
| R8:       | 43.8 |      |       |



**Test Conditions**

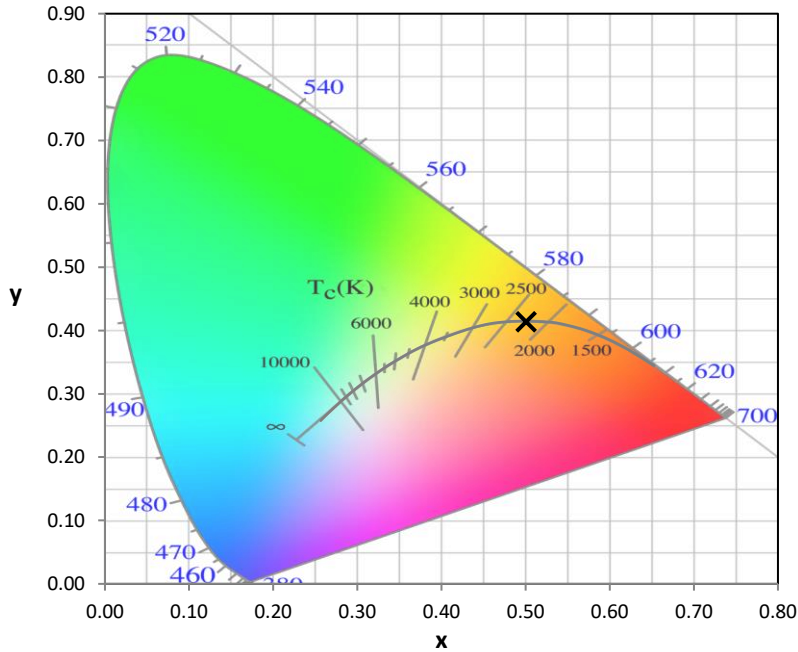
Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.7/41%  
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-1908-441-10-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2200K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-10-R4

**Photopic Flux vs. Wavelength**



#####

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 1768          | NR            | 490    | 5206          | NR            | 620    | 130919        | NR            | 750    | 8553          | NR            | 880    | 2713          | NR            |
| 365    | 1569          | NR            | 495    | 7286          | NR            | 625    | 125335        | NR            | 755    | 7696          | NR            | 885    | 2316          | NR            |
| 370    | 1594          | NR            | 500    | 10654         | NR            | 630    | 118388        | NR            | 760    | 6978          | NR            | 890    | 2539          | NR            |
| 375    | 1744          | NR            | 505    | 15189         | NR            | 635    | 111855        | NR            | 765    | 6377          | NR            | 895    | 1933          | NR            |
| 380    | 1659          | NR            | 510    | 20541         | NR            | 640    | 104062        | NR            | 770    | 5600          | NR            | 900    | 2216          | NR            |
| 385    | 1504          | NR            | 515    | 26492         | NR            | 645    | 96365         | NR            | 775    | 5000          | NR            | 905    | 2067          | NR            |
| 390    | 1541          | NR            | 520    | 32294         | NR            | 650    | 88651         | NR            | 780    | 4709          | NR            | 910    | 1959          | NR            |
| 395    | 1355          | NR            | 525    | 38123         | NR            | 655    | 81152         | NR            | 785    | 4305          | NR            | 915    | 1874          | NR            |
| 400    | 1243          | NR            | 530    | 43232         | NR            | 660    | 73523         | NR            | 790    | 4040          | NR            | 920    | 1484          | NR            |
| 405    | 1417          | NR            | 535    | 48012         | NR            | 665    | 66123         | NR            | 795    | 3642          | NR            | 925    | 1914          | NR            |
| 410    | 2147          | NR            | 540    | 52623         | NR            | 670    | 58677         | NR            | 800    | 3594          | NR            | 930    | 1948          | NR            |
| 415    | 3837          | NR            | 545    | 57516         | NR            | 675    | 52349         | NR            | 805    | 3190          | NR            | 935    | 2079          | NR            |
| 420    | 7159          | NR            | 550    | 62613         | NR            | 680    | 46159         | NR            | 810    | 3241          | NR            | 940    | 2263          | NR            |
| 425    | 12599         | NR            | 555    | 68554         | NR            | 685    | 40525         | NR            | 815    | 2732          | NR            | 945    | 1688          | NR            |
| 430    | 19019         | NR            | 560    | 75325         | NR            | 690    | 35615         | NR            | 820    | 2612          | NR            | 950    | 1560          | NR            |
| 435    | 24875         | NR            | 565    | 82533         | NR            | 695    | 31158         | NR            | 825    | 2966          | NR            | 955    | 2826          | NR            |
| 440    | 29103         | NR            | 570    | 90909         | NR            | 700    | 27409         | NR            | 830    | 2574          | NR            | 960    | 1477          | NR            |
| 445    | 29901         | NR            | 575    | 99621         | NR            | 705    | 24204         | NR            | 835    | 2633          | NR            | 965    | 1568          | NR            |
| 450    | 24862         | NR            | 580    | 108484        | NR            | 710    | 21558         | NR            | 840    | 2526          | NR            | 970    | 2030          | NR            |
| 455    | 15942         | NR            | 585    | 116679        | NR            | 715    | 19222         | NR            | 845    | 2631          | NR            | 975    | 1986          | NR            |
| 460    | 9916          | NR            | 590    | 123752        | NR            | 720    | 17310         | NR            | 850    | 2079          | NR            | 980    | 2540          | NR            |
| 465    | 7051          | NR            | 595    | 129324        | NR            | 725    | 15280         | NR            | 855    | 2309          | NR            | 985    | 1139          | NR            |
| 470    | 5227          | NR            | 600    | 134082        | NR            | 730    | 13282         | NR            | 860    | 2528          | NR            | 990    | 2018          | NR            |
| 475    | 4257          | NR            | 605    | 135698        | NR            | 735    | 11753         | NR            | 865    | 2121          | NR            | 995    | 3445          | NR            |
| 480    | 4052          | NR            | 610    | 135144        | NR            | 740    | 10654         | NR            | 870    | 2751          | NR            | 1000   | 3704          | NR            |
| 485    | 4298          | NR            | 615    | 134180        | NR            | 745    | 9451          | NR            | 875    | 2317          | NR            |        |               |               |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 1768          | NR            | 490    | 5206          | NR            | 620    | 130919        | NR            | 750    | 8553          | NR            | 880    | 2713          | NR            |
| 365    | 1569          | NR            | 495    | 7286          | NR            | 625    | 125335        | NR            | 755    | 7696          | NR            | 885    | 2316          | NR            |
| 370    | 1594          | NR            | 500    | 10654         | NR            | 630    | 118388        | NR            | 760    | 6978          | NR            | 890    | 2539          | NR            |
| 375    | 1744          | NR            | 505    | 15189         | NR            | 635    | 111855        | NR            | 765    | 6377          | NR            | 895    | 1933          | NR            |
| 380    | 1659          | NR            | 510    | 20541         | NR            | 640    | 104062        | NR            | 770    | 5600          | NR            | 900    | 2216          | NR            |
| 385    | 1504          | NR            | 515    | 26492         | NR            | 645    | 96365         | NR            | 775    | 5000          | NR            | 905    | 2067          | NR            |
| 390    | 1541          | NR            | 520    | 32294         | NR            | 650    | 88651         | NR            | 780    | 4709          | NR            | 910    | 1959          | NR            |
| 395    | 1355          | NR            | 525    | 38123         | NR            | 655    | 81152         | NR            | 785    | 4305          | NR            | 915    | 1874          | NR            |
| 400    | 1243          | NR            | 530    | 43232         | NR            | 660    | 73523         | NR            | 790    | 4040          | NR            | 920    | 1484          | NR            |
| 405    | 1417          | NR            | 535    | 48012         | NR            | 665    | 66123         | NR            | 795    | 3642          | NR            | 925    | 1914          | NR            |
| 410    | 2147          | NR            | 540    | 52623         | NR            | 670    | 58677         | NR            | 800    | 3594          | NR            | 930    | 1948          | NR            |
| 415    | 3837          | NR            | 545    | 57516         | NR            | 675    | 52349         | NR            | 805    | 3190          | NR            | 935    | 2079          | NR            |
| 420    | 7159          | NR            | 550    | 62613         | NR            | 680    | 46159         | NR            | 810    | 3241          | NR            | 940    | 2263          | NR            |
| 425    | 12599         | NR            | 555    | 68554         | NR            | 685    | 40525         | NR            | 815    | 2732          | NR            | 945    | 1688          | NR            |
| 430    | 19019         | NR            | 560    | 75325         | NR            | 690    | 35615         | NR            | 820    | 2612          | NR            | 950    | 1560          | NR            |
| 435    | 24875         | NR            | 565    | 82533         | NR            | 695    | 31158         | NR            | 825    | 2966          | NR            | 955    | 2826          | NR            |
| 440    | 29103         | NR            | 570    | 90909         | NR            | 700    | 27409         | NR            | 830    | 2574          | NR            | 960    | 1477          | NR            |
| 445    | 29901         | NR            | 575    | 99621         | NR            | 705    | 24204         | NR            | 835    | 2633          | NR            | 965    | 1568          | NR            |
| 450    | 24862         | NR            | 580    | 108484        | NR            | 710    | 21558         | NR            | 840    | 2526          | NR            | 970    | 2030          | NR            |
| 455    | 15942         | NR            | 585    | 116679        | NR            | 715    | 19222         | NR            | 845    | 2631          | NR            | 975    | 1986          | NR            |
| 460    | 9916          | NR            | 590    | 123752        | NR            | 720    | 17310         | NR            | 850    | 2079          | NR            | 980    | 2540          | NR            |
| 465    | 7051          | NR            | 595    | 129324        | NR            | 725    | 15280         | NR            | 855    | 2309          | NR            | 985    | 1139          | NR            |
| 470    | 5227          | NR            | 600    | 134082        | NR            | 730    | 13282         | NR            | 860    | 2528          | NR            | 990    | 2018          | NR            |
| 475    | 4257          | NR            | 605    | 135698        | NR            | 735    | 11753         | NR            | 865    | 2121          | NR            | 995    | 3445          | NR            |
| 480    | 4052          | NR            | 610    | 135144        | NR            | 740    | 10654         | NR            | 870    | 2751          | NR            | 1000   | 3704          | NR            |
| 485    | 4298          | NR            | 615    | 134180        | NR            | 745    | 9451          | NR            | 875    | 2317          | NR            |        |               |               |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 1470.8 M/P: 0.27**

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 1768          | NR            | 490    | 5206          | NR            | 620    | 130919        | NR            | 750    | 8553          | NR            | 880    | 2713          | NR            |
| 365    | 1569          | NR            | 495    | 7286          | NR            | 625    | 125335        | NR            | 755    | 7696          | NR            | 885    | 2316          | NR            |
| 370    | 1594          | NR            | 500    | 10654         | NR            | 630    | 118388        | NR            | 760    | 6978          | NR            | 890    | 2539          | NR            |
| 375    | 1744          | NR            | 505    | 15189         | NR            | 635    | 111855        | NR            | 765    | 6377          | NR            | 895    | 1933          | NR            |
| 380    | 1659          | NR            | 510    | 20541         | NR            | 640    | 104062        | NR            | 770    | 5600          | NR            | 900    | 2216          | NR            |
| 385    | 1504          | NR            | 515    | 26492         | NR            | 645    | 96365         | NR            | 775    | 5000          | NR            | 905    | 2067          | NR            |
| 390    | 1541          | NR            | 520    | 32294         | NR            | 650    | 88651         | NR            | 780    | 4709          | NR            | 910    | 1959          | NR            |
| 395    | 1355          | NR            | 525    | 38123         | NR            | 655    | 81152         | NR            | 785    | 4305          | NR            | 915    | 1874          | NR            |
| 400    | 1243          | NR            | 530    | 43232         | NR            | 660    | 73523         | NR            | 790    | 4040          | NR            | 920    | 1484          | NR            |
| 405    | 1417          | NR            | 535    | 48012         | NR            | 665    | 66123         | NR            | 795    | 3642          | NR            | 925    | 1914          | NR            |
| 410    | 2147          | NR            | 540    | 52623         | NR            | 670    | 58677         | NR            | 800    | 3594          | NR            | 930    | 1948          | NR            |
| 415    | 3837          | NR            | 545    | 57516         | NR            | 675    | 52349         | NR            | 805    | 3190          | NR            | 935    | 2079          | NR            |
| 420    | 7159          | NR            | 550    | 62613         | NR            | 680    | 46159         | NR            | 810    | 3241          | NR            | 940    | 2263          | NR            |
| 425    | 12599         | NR            | 555    | 68554         | NR            | 685    | 40525         | NR            | 815    | 2732          | NR            | 945    | 1688          | NR            |
| 430    | 19019         | NR            | 560    | 75325         | NR            | 690    | 35615         | NR            | 820    | 2612          | NR            | 950    | 1560          | NR            |
| 435    | 24875         | NR            | 565    | 82533         | NR            | 695    | 31158         | NR            | 825    | 2966          | NR            | 955    | 2826          | NR            |
| 440    | 29103         | NR            | 570    | 90909         | NR            | 700    | 27409         | NR            | 830    | 2574          | NR            | 960    | 1477          | NR            |
| 445    | 29901         | NR            | 575    | 99621         | NR            | 705    | 24204         | NR            | 835    | 2633          | NR            | 965    | 1568          | NR            |
| 450    | 24862         | NR            | 580    | 108484        | NR            | 710    | 21558         | NR            | 840    | 2526          | NR            | 970    | 2030          | NR            |
| 455    | 15942         | NR            | 585    | 116679        | NR            | 715    | 19222         | NR            | 845    | 2631          | NR            | 975    | 1986          | NR            |
| 460    | 9916          | NR            | 590    | 123752        | NR            | 720    | 17310         | NR            | 850    | 2079          | NR            | 980    | 2540          | NR            |
| 465    | 7051          | NR            | 595    | 129324        | NR            | 725    | 15280         | NR            | 855    | 2309          | NR            | 985    | 1139          | NR            |
| 470    | 5227          | NR            | 600    | 134082        | NR            | 730    | 13282         | NR            | 860    | 2528          | NR            | 990    | 2018          | NR            |
| 475    | 4257          | NR            | 605    | 135698        | NR            | 735    | 11753         | NR            | 865    | 2121          | NR            | 995    | 3445          | NR            |
| 480    | 4052          | NR            | 610    | 135144        | NR            | 740    | 10654         | NR            | 870    | 2751          | NR            | 1000   | 3704          | NR            |
| 485    | 4298          | NR            | 615    | 134180        | NR            | 745    | 9451          | NR            | 875    | 2317          | NR            |        |               |               |

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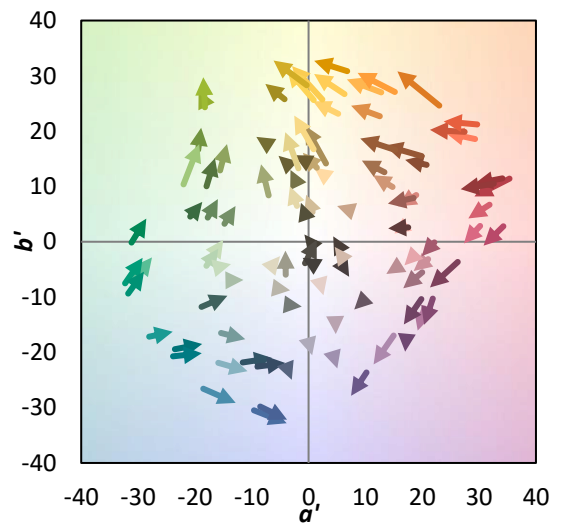
TM-30-18

**Summary**

$R_f = 69.8$   
 $R_g = 99.2$   
 $CIE R_a = 72.0$   
 $R_g = -17.4$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)