

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: P438051

Luminaire Tested: **IST-SA1A-750-U-SL4**

Issue Date: 12/10/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P438051  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/10/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: IST-SA1A-750-U-SL4  
Description: IMPACT ELITE LED TRAPEZOID LUMINAIRE  
(1) 70 CRI, 5000K, 350mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV SPILL LIGHT  
ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2666 lumens  
Efficiency: N/A  
Efficacy: 132.6 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G1

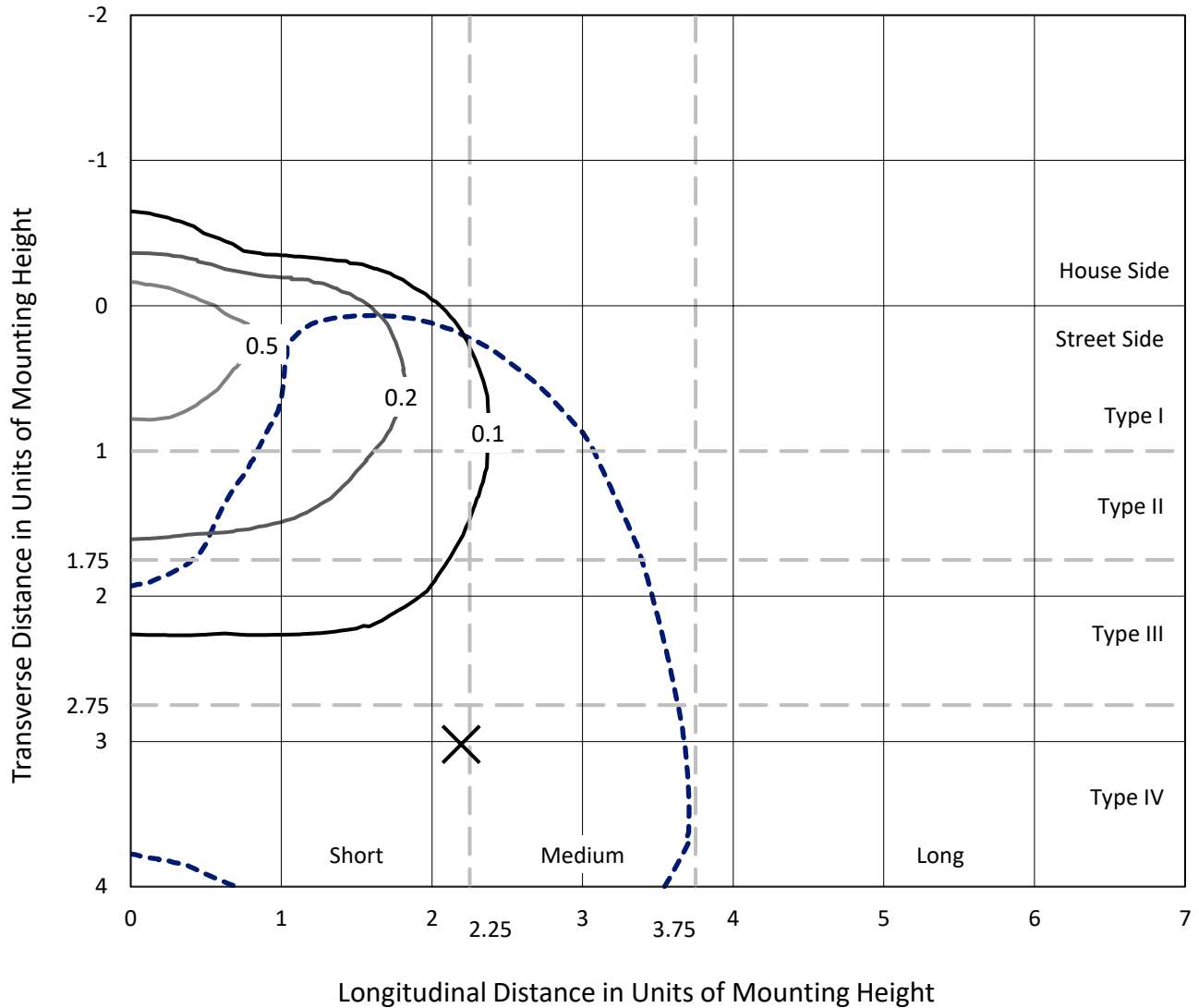
Input Watts (W): 20.1  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

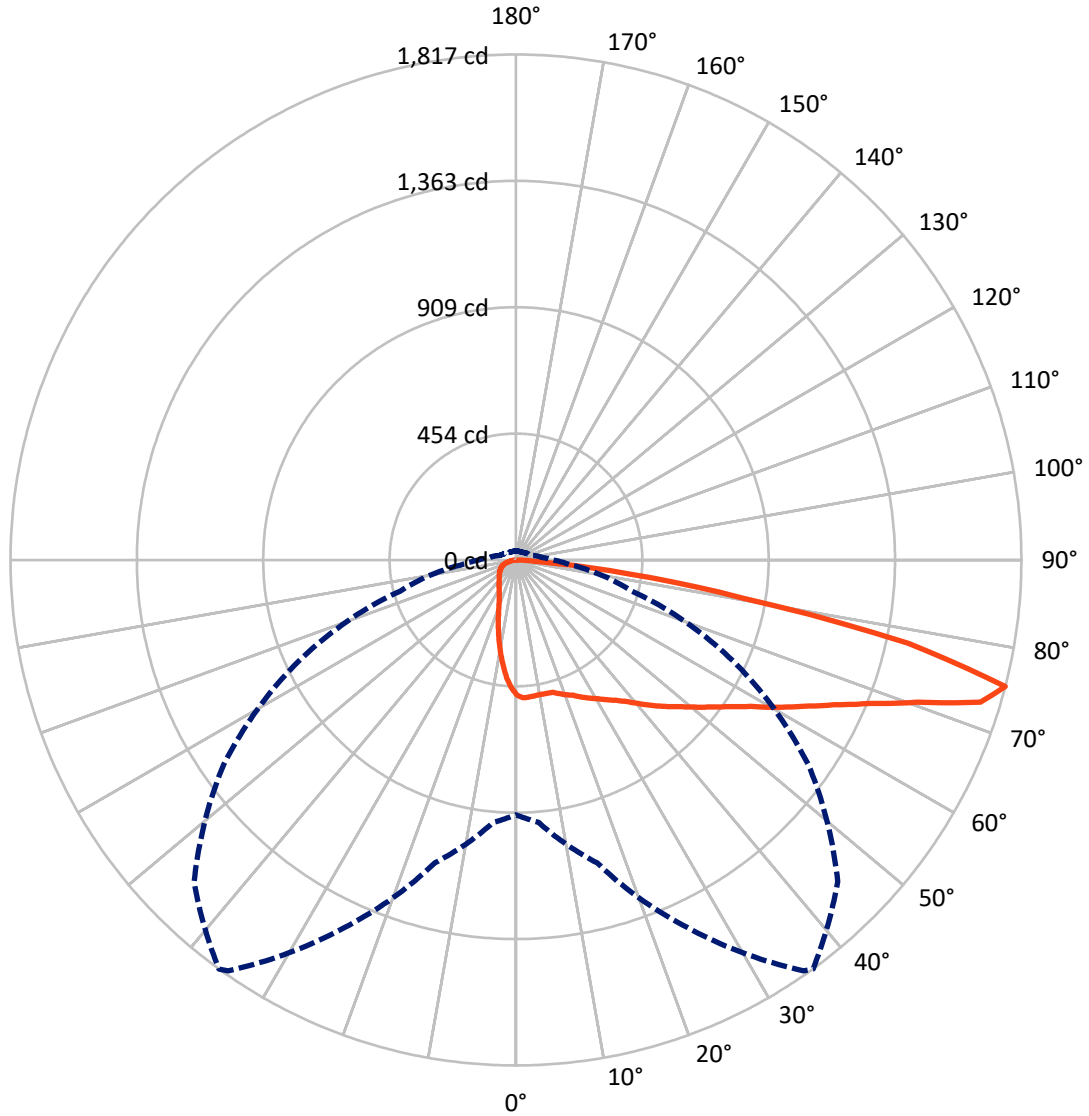
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.8 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 36-Deg Lateral    - - - Horizontal Cone Through 75-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 393.5    | 0.0    | 393.5  |
|                    | % Fixture | 14.8     | 0.0    | 14.8   |
| <b>Street Side</b> | Lumens    | 2272.5   | 0.0    | 2272.5 |
|                    | % Fixture | 85.2     | 0.0    | 85.2   |
| <b>Total</b>       | Lumens    | 2666.0   | 0.0    | 2666.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 42.9   | 1.6       |
| 10°-20°   | 110.9  | 4.2       |
| 20°-30°   | 171.5  | 6.4       |
| 30°-40°   | 248.5  | 9.3       |
| 40°-50°   | 359.4  | 13.5      |
| 50°-60°   | 498.4  | 18.7      |
| 60°-70°   | 629.4  | 23.6      |
| 70°-80°   | 540.6  | 20.3      |
| 80°-90°   | 64.4   | 2.4       |
| 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°    | 2666.0 | 100.0     |
| 0°-180°   | 2666.0 | 100.0     |

**Coefficient of Utilization**

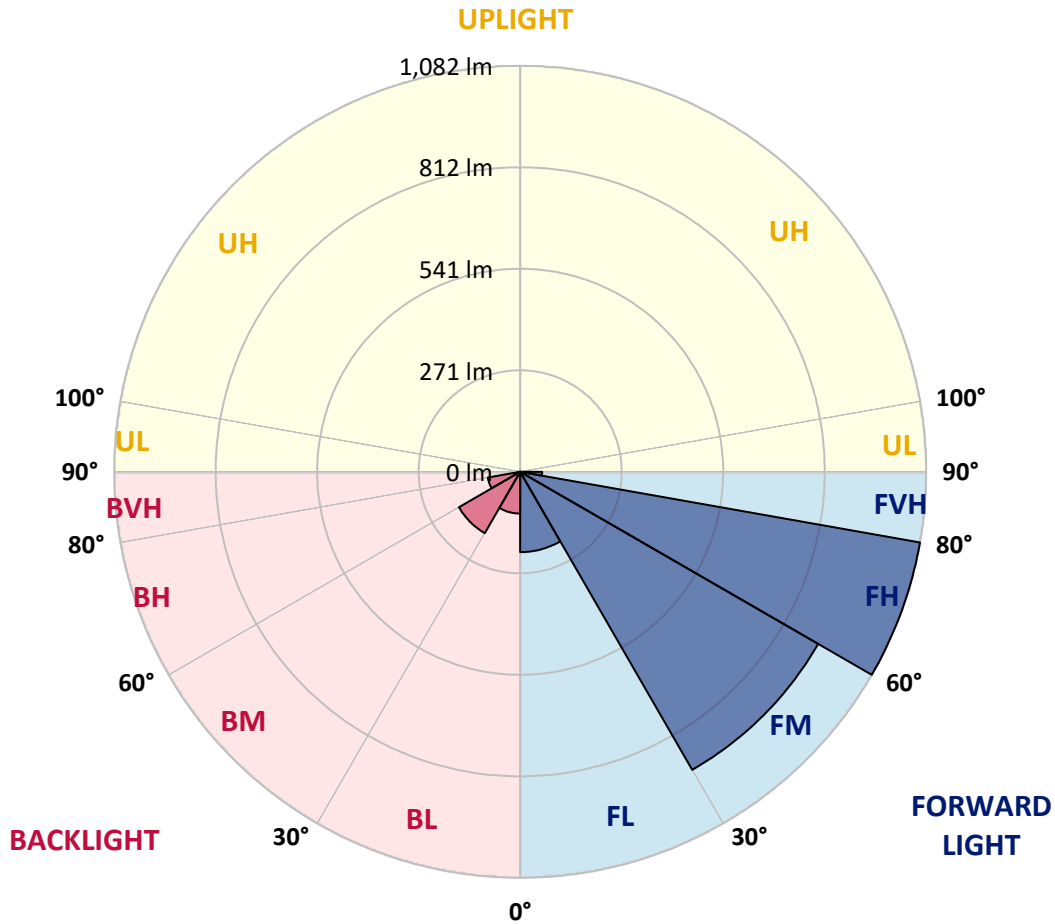


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 214.1  | 8.0       |                         |      |         |
| FM (30°-60°)   | 917.6  | 34.4      |                         |      |         |
| FH (60°-80°)   | 1082.4 | 40.6      |                         |      | G1/1800 |
| FVH (80°-90°)  | 58.5   | 2.2       |                         |      | G1/100  |
| BL (0°-30°)    | 111.3  | 4.2       | B1/500                  |      |         |
| BM (30°-60°)   | 188.6  | 7.1       | B0/220                  |      |         |
| BH (60°-80°)   | 87.6   | 3.3       | B0/110                  |      | G0/110  |
| BVH (80°-90°)  | 6.0    | 0.2       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**  
 Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 36°    | 45°    | 55°    | 65°    | 75°    | 85°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 0°    | 486.4  | 486.4  | 486.4  | 486.4  | 486.4  | 486.4  | 486.4  | 486.4  | 486.4  | 486.4  | 486.4 |
| 2.5°  | 500.3  | 500.3  | 500.3  | 499.3  | 497.3  | 496.3  | 494.4  | 492.4  | 491.4  | 487.4  | 486.4 |
| 5°    | 500.3  | 501.3  | 500.3  | 499.3  | 497.3  | 495.4  | 493.4  | 489.4  | 486.4  | 481.4  | 476.5 |
| 7.5°  | 495.4  | 496.3  | 496.3  | 495.4  | 493.4  | 492.4  | 490.4  | 485.4  | 481.4  | 474.5  | 466.5 |
| 10°   | 487.4  | 489.4  | 489.4  | 490.4  | 491.4  | 491.4  | 489.4  | 485.4  | 479.4  | 471.5  | 458.5 |
| 12.5° | 477.4  | 482.4  | 485.4  | 488.4  | 492.4  | 492.4  | 493.4  | 487.4  | 482.4  | 471.5  | 458.5 |
| 15°   | 474.5  | 477.4  | 483.4  | 492.4  | 496.3  | 493.4  | 497.3  | 494.4  | 488.4  | 477.4  | 461.5 |
| 17.5° | 473.5  | 476.5  | 486.4  | 497.3  | 503.3  | 505.3  | 505.3  | 501.3  | 494.4  | 483.4  | 463.5 |
| 20°   | 477.4  | 481.4  | 494.4  | 508.3  | 517.2  | 517.2  | 516.2  | 511.3  | 502.3  | 489.4  | 467.5 |
| 22.5° | 490.4  | 491.4  | 506.3  | 523.2  | 530.2  | 528.2  | 530.2  | 521.2  | 511.3  | 498.3  | 472.5 |
| 25°   | 507.3  | 509.3  | 521.2  | 541.1  | 545.1  | 546.1  | 543.1  | 533.1  | 522.2  | 509.3  | 478.4 |
| 27.5° | 530.2  | 533.1  | 542.1  | 561.0  | 564.0  | 562.0  | 558.0  | 546.1  | 535.1  | 523.2  | 490.4 |
| 30°   | 557.0  | 559.0  | 570.0  | 577.9  | 580.9  | 578.9  | 575.9  | 563.0  | 554.0  | 543.1  | 508.3 |
| 32.5° | 582.9  | 583.9  | 595.8  | 603.8  | 598.8  | 598.8  | 594.8  | 581.9  | 574.9  | 572.9  | 531.2 |
| 35°   | 609.7  | 611.7  | 622.7  | 626.6  | 618.7  | 619.7  | 618.7  | 607.7  | 609.7  | 613.7  | 566.0 |
| 37.5° | 634.6  | 637.6  | 650.5  | 651.5  | 648.5  | 645.5  | 648.5  | 642.6  | 646.5  | 662.5  | 606.8 |
| 40°   | 656.5  | 660.5  | 676.4  | 679.4  | 678.4  | 678.4  | 680.4  | 679.4  | 694.3  | 720.1  | 656.5 |
| 42.5° | 674.4  | 679.4  | 698.3  | 706.2  | 712.2  | 715.2  | 722.1  | 724.1  | 746.0  | 787.8  | 714.2 |
| 45°   | 692.3  | 697.3  | 723.1  | 736.1  | 750.0  | 751.0  | 764.9  | 771.9  | 812.7  | 850.5  | 776.8 |
| 47.5° | 713.2  | 719.2  | 743.0  | 768.9  | 784.8  | 787.8  | 813.6  | 827.6  | 877.3  | 926.0  | 835.5 |
| 50°   | 742.0  | 744.0  | 762.9  | 806.7  | 826.6  | 831.6  | 860.4  | 889.2  | 944.0  | 992.7  | 887.3 |
| 52.5° | 777.8  | 775.8  | 784.8  | 840.5  | 871.3  | 878.3  | 925.1  | 953.9  | 1019.5 | 1064.3 | 928.0 |
| 55°   | 807.7  | 805.7  | 818.6  | 879.3  | 928.0  | 930.0  | 985.7  | 1013.6 | 1089.2 | 1117.0 | 962.8 |
| 57.5° | 842.5  | 838.5  | 851.4  | 926.0  | 992.7  | 993.7  | 1058.3 | 1090.2 | 1151.8 | 1163.8 | 985.7 |
| 60°   | 871.3  | 871.3  | 888.2  | 971.8  | 1064.3 | 1075.2 | 1133.9 | 1158.8 | 1212.5 | 1197.6 | 996.7 |
| 62.5° | 898.2  | 903.2  | 927.0  | 1032.5 | 1148.9 | 1157.8 | 1217.5 | 1227.4 | 1275.2 | 1223.5 | 984.7 |
| 65°   | 930.0  | 938.0  | 983.7  | 1105.1 | 1249.3 | 1255.3 | 1305.0 | 1318.9 | 1337.8 | 1222.5 | 933.0 |
| 67.5° | 963.8  | 976.8  | 1037.5 | 1186.7 | 1359.7 | 1375.6 | 1429.4 | 1415.4 | 1379.6 | 1183.7 | 824.6 |
| 70°   | 1009.6 | 1025.5 | 1112.1 | 1295.1 | 1510.9 | 1530.8 | 1601.4 | 1515.9 | 1357.7 | 1045.4 | 668.4 |
| 72.5° | 1044.4 | 1065.3 | 1183.7 | 1435.3 | 1715.8 | 1746.7 | 1729.7 | 1517.9 | 1217.5 | 833.5  | 447.6 |
| 75°   | 916.1  | 947.9  | 1127.0 | 1458.2 | 1803.4 | 1817.3 | 1636.2 | 1283.1 | 862.4  | 430.7  | 193.0 |
| 77.5° | 669.4  | 667.4  | 823.6  | 1132.9 | 1478.1 | 1441.3 | 1241.4 | 834.5  | 409.8  | 156.2  | 97.5  |
| 80°   | 336.2  | 323.3  | 445.6  | 603.8  | 797.7  | 822.6  | 734.1  | 433.7  | 162.1  | 83.6   | 58.7  |
| 82.5° | 124.3  | 127.3  | 163.1  | 246.7  | 400.9  | 406.8  | 296.4  | 184.0  | 88.5   | 43.8   | 30.8  |
| 85°   | 47.7   | 49.7   | 53.7   | 53.7   | 74.6   | 82.6   | 76.6   | 73.6   | 29.8   | 14.9   | 16.9  |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0    | 1.0   |
| 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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 CATALOG NUMBER: IST-SA1A-750-U-SL4

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 486.4 | 486.4 | 486.4 | 486.4 | 486.4 | 486.4 | 486.4 | 486.4 | 486.4 | 486.4 | 486.4 |
| 2.5°  | 483.4 | 481.4 | 477.4 | 470.5 | 466.5 | 463.5 | 459.5 | 455.6 | 454.6 | 453.6 | 458.5 |
| 5°    | 471.5 | 468.5 | 458.5 | 449.6 | 439.6 | 431.7 | 423.7 | 416.8 | 412.8 | 411.8 | 413.8 |
| 7.5°  | 459.5 | 455.6 | 440.6 | 422.7 | 405.8 | 391.9 | 378.0 | 371.0 | 360.1 | 360.1 | 361.1 |
| 10°   | 452.6 | 445.6 | 424.7 | 397.9 | 376.0 | 351.1 | 334.2 | 317.3 | 310.3 | 305.4 | 303.4 |
| 12.5° | 448.6 | 437.7 | 409.8 | 380.0 | 346.1 | 313.3 | 290.4 | 269.6 | 258.6 | 250.7 | 250.7 |
| 15°   | 449.6 | 437.7 | 399.9 | 361.1 | 317.3 | 277.5 | 248.7 | 225.8 | 211.9 | 203.9 | 201.9 |
| 17.5° | 448.6 | 433.7 | 387.9 | 337.2 | 288.5 | 246.7 | 211.9 | 188.0 | 174.1 | 169.1 | 168.1 |
| 20°   | 450.6 | 430.7 | 374.0 | 315.3 | 260.6 | 215.8 | 180.0 | 158.2 | 150.2 | 146.2 | 145.2 |
| 22.5° | 451.6 | 424.7 | 360.1 | 291.4 | 230.8 | 187.0 | 157.2 | 142.2 | 136.3 | 133.3 | 132.3 |
| 25°   | 453.6 | 423.7 | 344.2 | 269.6 | 205.9 | 165.1 | 142.2 | 129.3 | 126.3 | 124.3 | 124.3 |
| 27.5° | 461.5 | 423.7 | 330.2 | 241.7 | 180.0 | 147.2 | 129.3 | 121.4 | 119.4 | 118.4 | 118.4 |
| 30°   | 471.5 | 425.7 | 317.3 | 218.8 | 160.1 | 133.3 | 120.4 | 114.4 | 113.4 | 112.4 | 112.4 |
| 32.5° | 488.4 | 432.7 | 302.4 | 196.9 | 143.2 | 123.3 | 113.4 | 108.4 | 106.4 | 106.4 | 106.4 |
| 35°   | 511.3 | 444.6 | 287.5 | 177.1 | 129.3 | 113.4 | 106.4 | 101.5 | 100.5 | 101.5 | 101.5 |
| 37.5° | 544.1 | 458.5 | 274.5 | 159.1 | 118.4 | 105.4 | 99.5  | 96.5  | 95.5  | 95.5  | 96.5  |
| 40°   | 584.9 | 483.4 | 261.6 | 145.2 | 110.4 | 98.5  | 94.5  | 91.5  | 90.5  | 91.5  | 91.5  |
| 42.5° | 629.6 | 510.3 | 250.7 | 131.3 | 102.5 | 93.5  | 88.5  | 86.5  | 85.5  | 86.5  | 87.5  |
| 45°   | 679.4 | 538.1 | 241.7 | 121.4 | 96.5  | 88.5  | 84.5  | 83.6  | 82.6  | 82.6  | 83.6  |
| 47.5° | 721.1 | 568.0 | 234.7 | 114.4 | 91.5  | 84.5  | 81.6  | 79.6  | 78.6  | 77.6  | 78.6  |
| 50°   | 759.9 | 590.8 | 232.8 | 110.4 | 88.5  | 80.6  | 77.6  | 75.6  | 74.6  | 73.6  | 74.6  |
| 52.5° | 788.8 | 602.8 | 232.8 | 107.4 | 85.5  | 77.6  | 74.6  | 72.6  | 71.6  | 69.6  | 70.6  |
| 55°   | 808.7 | 608.7 | 229.8 | 105.4 | 82.6  | 74.6  | 70.6  | 69.6  | 68.6  | 66.6  | 66.6  |
| 57.5° | 820.6 | 607.7 | 218.8 | 104.4 | 81.6  | 70.6  | 67.6  | 66.6  | 65.6  | 63.7  | 63.7  |
| 60°   | 818.6 | 588.9 | 198.9 | 100.5 | 79.6  | 67.6  | 63.7  | 63.7  | 63.7  | 61.7  | 61.7  |
| 62.5° | 789.8 | 536.1 | 166.1 | 94.5  | 77.6  | 64.7  | 59.7  | 61.7  | 62.7  | 60.7  | 60.7  |
| 65°   | 712.2 | 455.6 | 137.3 | 86.5  | 72.6  | 61.7  | 56.7  | 59.7  | 61.7  | 60.7  | 59.7  |
| 67.5° | 599.8 | 361.1 | 113.4 | 78.6  | 67.6  | 57.7  | 52.7  | 56.7  | 57.7  | 57.7  | 57.7  |
| 70°   | 463.5 | 259.6 | 93.5  | 68.6  | 60.7  | 51.7  | 47.7  | 49.7  | 50.7  | 50.7  | 51.7  |
| 72.5° | 274.5 | 155.2 | 76.6  | 58.7  | 51.7  | 44.8  | 41.8  | 42.8  | 41.8  | 41.8  | 41.8  |
| 75°   | 135.3 | 96.5  | 61.7  | 49.7  | 43.8  | 37.8  | 34.8  | 32.8  | 32.8  | 32.8  | 31.8  |
| 77.5° | 82.6  | 71.6  | 50.7  | 39.8  | 34.8  | 28.8  | 26.9  | 24.9  | 24.9  | 24.9  | 24.9  |
| 80°   | 58.7  | 55.7  | 38.8  | 29.8  | 23.9  | 20.9  | 19.9  | 18.9  | 18.9  | 17.9  | 17.9  |
| 82.5° | 36.8  | 41.8  | 28.8  | 19.9  | 15.9  | 14.9  | 13.9  | 12.9  | 11.9  | 10.9  | 10.9  |
| 85°   | 20.9  | 26.9  | 16.9  | 10.9  | 9.0   | 7.0   | 6.0   | 6.0   | 5.0   | 5.0   | 4.0   |
| 87.5° | 1.0   | 2.0   | 2.0   | 2.0   | 2.0   | 1.0   | 1.0   | 1.0   | 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   |



LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

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**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-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-750-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):                  | 4884   | CRI (Ra): | 73.5 | R9:  | -28.4 |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R10: | 48.6  |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R11: | 73.2  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R12: | 50.7  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R13: | 71.2  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R14: | 91.4  |
| CIE z:                    | 0.2884 | R6:       | 70.7 |      |       |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



**Test Conditions**

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

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| 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 5000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



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| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 2945                                 | NR                             | 490               | 37941                                | NR                             | 620               | 88803                                | NR                             | 750               | 3908                                 | NR                             | 880               | 2997                                 | NR                             |
| 365               | 2596                                 | NR                             | 495               | 48525                                | NR                             | 625               | 80578                                | NR                             | 755               | 3988                                 | NR                             | 885               | 2927                                 | NR                             |
| 370               | 2732                                 | NR                             | 500               | 60609                                | NR                             | 630               | 73127                                | NR                             | 760               | 3335                                 | NR                             | 890               | 2649                                 | NR                             |
| 375               | 2894                                 | NR                             | 505               | 72036                                | NR                             | 635               | 66244                                | NR                             | 765               | 3438                                 | NR                             | 895               | 2828                                 | NR                             |
| 380               | 2822                                 | NR                             | 510               | 82168                                | NR                             | 640               | 59440                                | NR                             | 770               | 3427                                 | NR                             | 900               | 1407                                 | NR                             |
| 385               | 2394                                 | NR                             | 515               | 90898                                | NR                             | 645               | 52864                                | NR                             | 775               | 2759                                 | NR                             | 905               | 2224                                 | NR                             |
| 390               | 2370                                 | NR                             | 520               | 97142                                | NR                             | 650               | 47085                                | NR                             | 780               | 2340                                 | NR                             | 910               | 2905                                 | NR                             |
| 395               | 2267                                 | NR                             | 525               | 103255                               | NR                             | 655               | 41789                                | NR                             | 785               | 2412                                 | NR                             | 915               | 3350                                 | NR                             |
| 400               | 2262                                 | NR                             | 530               | 106697                               | NR                             | 660               | 37064                                | NR                             | 790               | 1999                                 | NR                             | 920               | 3114                                 | NR                             |
| 405               | 3000                                 | NR                             | 535               | 110081                               | NR                             | 665               | 32299                                | NR                             | 795               | 2054                                 | NR                             | 925               | 2834                                 | NR                             |
| 410               | 5324                                 | NR                             | 540               | 112494                               | NR                             | 670               | 28142                                | NR                             | 800               | 2331                                 | NR                             | 930               | 2271                                 | NR                             |
| 415               | 10725                                | NR                             | 545               | 115513                               | NR                             | 675               | 24505                                | NR                             | 805               | 2648                                 | NR                             | 935               | 2228                                 | NR                             |
| 420               | 22128                                | NR                             | 550               | 117203                               | NR                             | 680               | 21162                                | NR                             | 810               | 2485                                 | NR                             | 940               | 2833                                 | NR                             |
| 425               | 44095                                | NR                             | 555               | 119753                               | NR                             | 685               | 18400                                | NR                             | 815               | 2409                                 | NR                             | 945               | 2941                                 | NR                             |
| 430               | 77002                                | NR                             | 560               | 122602                               | NR                             | 690               | 16065                                | NR                             | 820               | 2221                                 | NR                             | 950               | 2323                                 | NR                             |
| 435               | 119881                               | NR                             | 565               | 124314                               | NR                             | 695               | 13860                                | NR                             | 825               | 1562                                 | NR                             | 955               | 1667                                 | NR                             |
| 440               | 164454                               | NR                             | 570               | 126775                               | NR                             | 700               | 12177                                | NR                             | 830               | 2249                                 | NR                             | 960               | 749                                  | NR                             |
| 445               | 179997                               | NR                             | 575               | 127511                               | NR                             | 705               | 10757                                | NR                             | 835               | 2573                                 | NR                             | 965               | 2669                                 | NR                             |
| 450               | 142822                               | NR                             | 580               | 127577                               | NR                             | 710               | 9601                                 | NR                             | 840               | 2764                                 | NR                             | 970               | 3968                                 | NR                             |
| 455               | 90008                                | NR                             | 585               | 126153                               | NR                             | 715               | 8944                                 | NR                             | 845               | 3109                                 | NR                             | 975               | 3886                                 | NR                             |
| 460               | 60557                                | NR                             | 590               | 123678                               | NR                             | 720               | 7947                                 | NR                             | 850               | 2963                                 | NR                             | 980               | 2788                                 | NR                             |
| 465               | 43305                                | NR                             | 595               | 119774                               | NR                             | 725               | 7062                                 | NR                             | 855               | 2336                                 | NR                             | 985               | 3496                                 | NR                             |
| 470               | 31089                                | NR                             | 600               | 115733                               | NR                             | 730               | 6004                                 | NR                             | 860               | 2118                                 | NR                             | 990               | 2913                                 | NR                             |
| 475               | 26278                                | NR                             | 605               | 109231                               | NR                             | 735               | 5594                                 | NR                             | 865               | 3144                                 | NR                             | 995               | 4659                                 | NR                             |
| 480               | 27060                                | NR                             | 610               | 102408                               | NR                             | 740               | 5165                                 | NR                             | 870               | 3069                                 | NR                             | 1000              | 1308                                 | NR                             |
| 485               | 30698                                | NR                             | 615               | 96015                                | NR                             | 745               | 4687                                 | NR                             | 875               | 3311                                 | NR                             |                   |                                      |                                |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5 S/P: 1.77

| 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    | 2945          | NR            | 490    | 37941         | NR            | 620    | 88803         | NR            | 750    | 3908          | NR            | 880    | 2997          | NR            |
| 365    | 2596          | NR            | 495    | 48525         | NR            | 625    | 80578         | NR            | 755    | 3988          | NR            | 885    | 2927          | NR            |
| 370    | 2732          | NR            | 500    | 60609         | NR            | 630    | 73127         | NR            | 760    | 3335          | NR            | 890    | 2649          | NR            |
| 375    | 2894          | NR            | 505    | 72036         | NR            | 635    | 66244         | NR            | 765    | 3438          | NR            | 895    | 2828          | NR            |
| 380    | 2822          | NR            | 510    | 82168         | NR            | 640    | 59440         | NR            | 770    | 3427          | NR            | 900    | 1407          | NR            |
| 385    | 2394          | NR            | 515    | 90898         | NR            | 645    | 52864         | NR            | 775    | 2759          | NR            | 905    | 2224          | NR            |
| 390    | 2370          | NR            | 520    | 97142         | NR            | 650    | 47085         | NR            | 780    | 2340          | NR            | 910    | 2905          | NR            |
| 395    | 2267          | NR            | 525    | 103255        | NR            | 655    | 41789         | NR            | 785    | 2412          | NR            | 915    | 3350          | NR            |
| 400    | 2262          | NR            | 530    | 106697        | NR            | 660    | 37064         | NR            | 790    | 1999          | NR            | 920    | 3114          | NR            |
| 405    | 3000          | NR            | 535    | 110081        | NR            | 665    | 32299         | NR            | 795    | 2054          | NR            | 925    | 2834          | NR            |
| 410    | 5324          | NR            | 540    | 112494        | NR            | 670    | 28142         | NR            | 800    | 2331          | NR            | 930    | 2271          | NR            |
| 415    | 10725         | NR            | 545    | 115513        | NR            | 675    | 24505         | NR            | 805    | 2648          | NR            | 935    | 2228          | NR            |
| 420    | 22128         | NR            | 550    | 117203        | NR            | 680    | 21162         | NR            | 810    | 2485          | NR            | 940    | 2833          | NR            |
| 425    | 44095         | NR            | 555    | 119753        | NR            | 685    | 18400         | NR            | 815    | 2409          | NR            | 945    | 2941          | NR            |
| 430    | 77002         | NR            | 560    | 122602        | NR            | 690    | 16065         | NR            | 820    | 2221          | NR            | 950    | 2323          | NR            |
| 435    | 119881        | NR            | 565    | 124314        | NR            | 695    | 13860         | NR            | 825    | 1562          | NR            | 955    | 1667          | NR            |
| 440    | 164454        | NR            | 570    | 126775        | NR            | 700    | 12177         | NR            | 830    | 2249          | NR            | 960    | 749           | NR            |
| 445    | 179997        | NR            | 575    | 127511        | NR            | 705    | 10757         | NR            | 835    | 2573          | NR            | 965    | 2669          | NR            |
| 450    | 142822        | NR            | 580    | 127577        | NR            | 710    | 9601          | NR            | 840    | 2764          | NR            | 970    | 3968          | NR            |
| 455    | 90008         | NR            | 585    | 126153        | NR            | 715    | 8944          | NR            | 845    | 3109          | NR            | 975    | 3886          | NR            |
| 460    | 60557         | NR            | 590    | 123678        | NR            | 720    | 7947          | NR            | 850    | 2963          | NR            | 980    | 2788          | NR            |
| 465    | 43305         | NR            | 595    | 119774        | NR            | 725    | 7062          | NR            | 855    | 2336          | NR            | 985    | 3496          | NR            |
| 470    | 31089         | NR            | 600    | 115733        | NR            | 730    | 6004          | NR            | 860    | 2118          | NR            | 990    | 2913          | NR            |
| 475    | 26278         | NR            | 605    | 109231        | NR            | 735    | 5594          | NR            | 865    | 3144          | NR            | 995    | 4659          | NR            |
| 480    | 27060         | NR            | 610    | 102408        | NR            | 740    | 5165          | NR            | 870    | 3069          | NR            | 1000   | 1308          | NR            |
| 485    | 30698         | NR            | 615    | 96015         | NR            | 745    | 4687          | NR            | 875    | 3311          | NR            |        |               |               |

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**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9 M/P: 0.71**

| 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    | 2945          | NR            | 490    | 37941         | NR            | 620    | 88803         | NR            | 750    | 3908          | NR            | 880    | 2997          | NR            |
| 365    | 2596          | NR            | 495    | 48525         | NR            | 625    | 80578         | NR            | 755    | 3988          | NR            | 885    | 2927          | NR            |
| 370    | 2732          | NR            | 500    | 60609         | NR            | 630    | 73127         | NR            | 760    | 3335          | NR            | 890    | 2649          | NR            |
| 375    | 2894          | NR            | 505    | 72036         | NR            | 635    | 66244         | NR            | 765    | 3438          | NR            | 895    | 2828          | NR            |
| 380    | 2822          | NR            | 510    | 82168         | NR            | 640    | 59440         | NR            | 770    | 3427          | NR            | 900    | 1407          | NR            |
| 385    | 2394          | NR            | 515    | 90898         | NR            | 645    | 52864         | NR            | 775    | 2759          | NR            | 905    | 2224          | NR            |
| 390    | 2370          | NR            | 520    | 97142         | NR            | 650    | 47085         | NR            | 780    | 2340          | NR            | 910    | 2905          | NR            |
| 395    | 2267          | NR            | 525    | 103255        | NR            | 655    | 41789         | NR            | 785    | 2412          | NR            | 915    | 3350          | NR            |
| 400    | 2262          | NR            | 530    | 106697        | NR            | 660    | 37064         | NR            | 790    | 1999          | NR            | 920    | 3114          | NR            |
| 405    | 3000          | NR            | 535    | 110081        | NR            | 665    | 32299         | NR            | 795    | 2054          | NR            | 925    | 2834          | NR            |
| 410    | 5324          | NR            | 540    | 112494        | NR            | 670    | 28142         | NR            | 800    | 2331          | NR            | 930    | 2271          | NR            |
| 415    | 10725         | NR            | 545    | 115513        | NR            | 675    | 24505         | NR            | 805    | 2648          | NR            | 935    | 2228          | NR            |
| 420    | 22128         | NR            | 550    | 117203        | NR            | 680    | 21162         | NR            | 810    | 2485          | NR            | 940    | 2833          | NR            |
| 425    | 44095         | NR            | 555    | 119753        | NR            | 685    | 18400         | NR            | 815    | 2409          | NR            | 945    | 2941          | NR            |
| 430    | 77002         | NR            | 560    | 122602        | NR            | 690    | 16065         | NR            | 820    | 2221          | NR            | 950    | 2323          | NR            |
| 435    | 119881        | NR            | 565    | 124314        | NR            | 695    | 13860         | NR            | 825    | 1562          | NR            | 955    | 1667          | NR            |
| 440    | 164454        | NR            | 570    | 126775        | NR            | 700    | 12177         | NR            | 830    | 2249          | NR            | 960    | 749           | NR            |
| 445    | 179997        | NR            | 575    | 127511        | NR            | 705    | 10757         | NR            | 835    | 2573          | NR            | 965    | 2669          | NR            |
| 450    | 142822        | NR            | 580    | 127577        | NR            | 710    | 9601          | NR            | 840    | 2764          | NR            | 970    | 3968          | NR            |
| 455    | 90008         | NR            | 585    | 126153        | NR            | 715    | 8944          | NR            | 845    | 3109          | NR            | 975    | 3886          | NR            |
| 460    | 60557         | NR            | 590    | 123678        | NR            | 720    | 7947          | NR            | 850    | 2963          | NR            | 980    | 2788          | NR            |
| 465    | 43305         | NR            | 595    | 119774        | NR            | 725    | 7062          | NR            | 855    | 2336          | NR            | 985    | 3496          | NR            |
| 470    | 31089         | NR            | 600    | 115733        | NR            | 730    | 6004          | NR            | 860    | 2118          | NR            | 990    | 2913          | NR            |
| 475    | 26278         | NR            | 605    | 109231        | NR            | 735    | 5594          | NR            | 865    | 3144          | NR            | 995    | 4659          | NR            |
| 480    | 27060         | NR            | 610    | 102408        | NR            | 740    | 5165          | NR            | 870    | 3069          | NR            | 1000   | 1308          | NR            |
| 485    | 30698         | NR            | 615    | 96015         | NR            | 745    | 4687          | NR            | 875    | 3311          | NR            |        |               |               |

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**Summary**

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$



**Color Vector Graphics**





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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)