

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: P438046

Luminaire Tested: **ISW-SA1A-750-U-SL2-HSS**

Issue Date: 12/10/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P438046  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-15)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/10/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: ISW-SA1A-750-U-SL2-HSS  
Description: IMPACT ELITE LED WEDGE LUMINAIRE  
(1) 70 CRI, 5000K, 350mA LIGHTSQUARE WITH 16 LEDS AND TYPE II SPILL LIGHT  
ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2211 lumens  
Efficiency: N/A  
Efficacy: 110.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B0 - U0 - G1

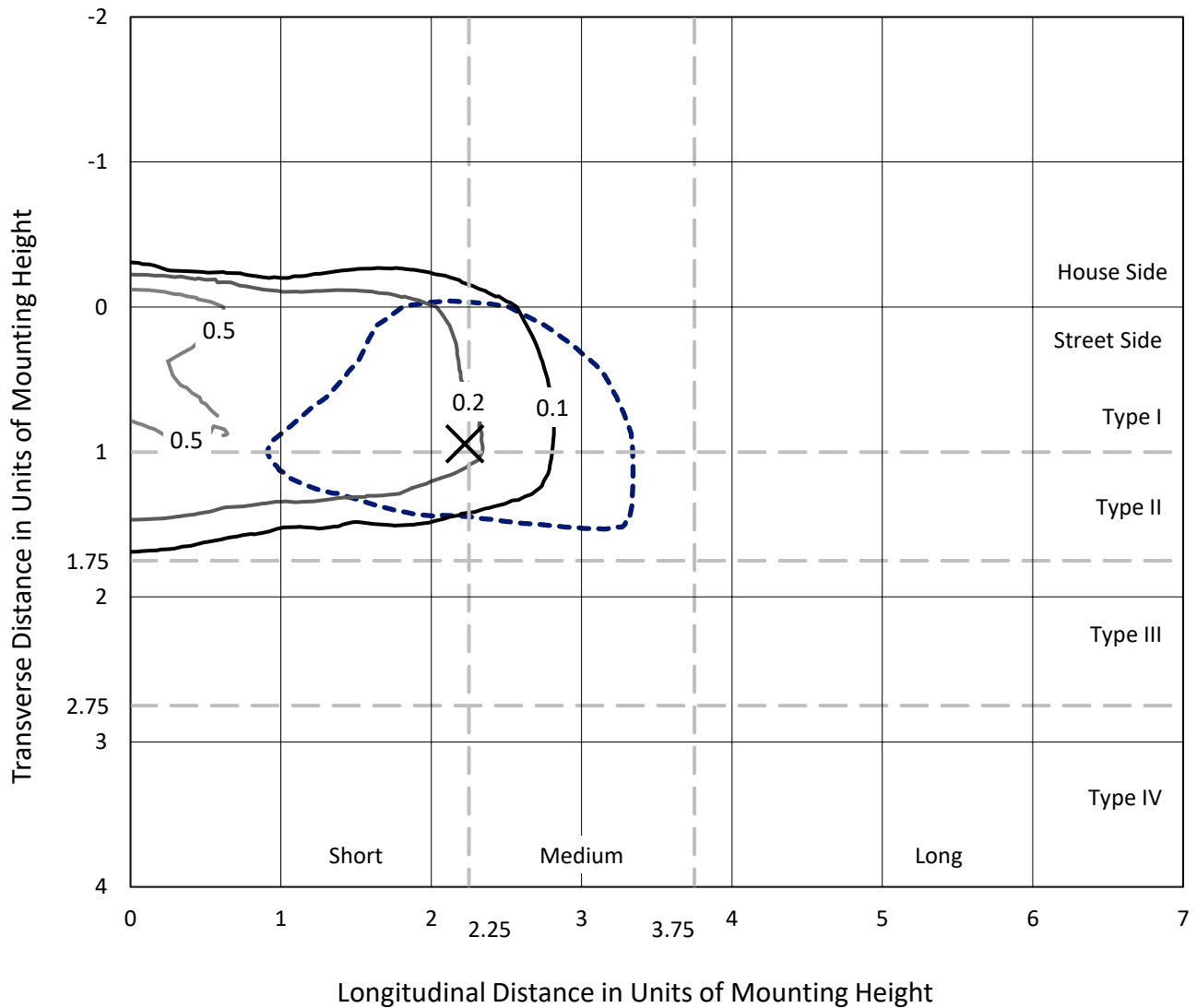
Input Watts (W): 20.1  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P438046  
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### Iso-Footcandle Lines of Horizontal Illumination

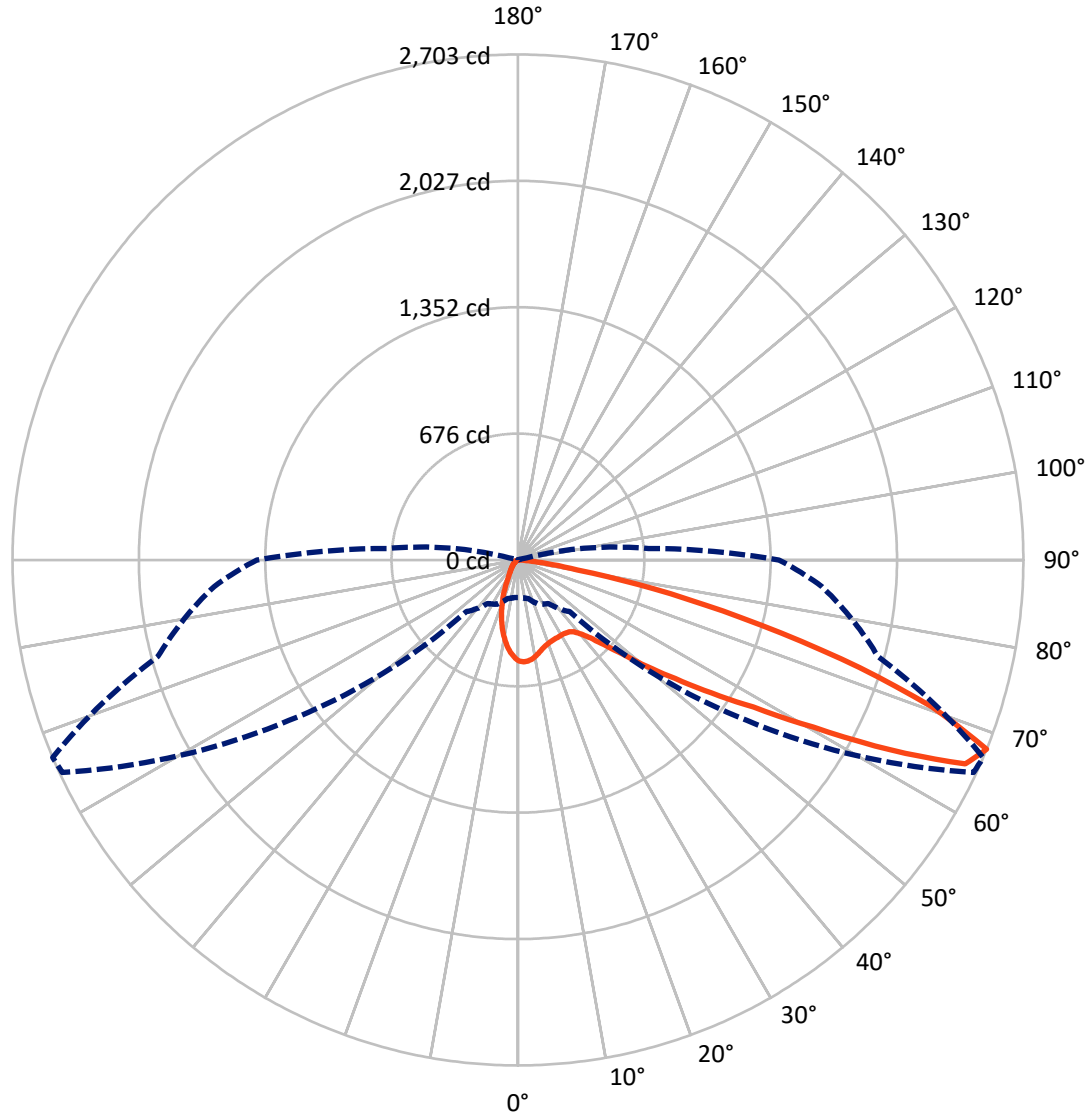
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.9 fc  
 Type II - Short - N/A

REPORT NUMBER: P438046  
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### Luminous Intensity Polar Plot



— Vertical Plane Through 67-Deg Lateral    - - - Horizontal Cone Through 67.5-Deg Vertical

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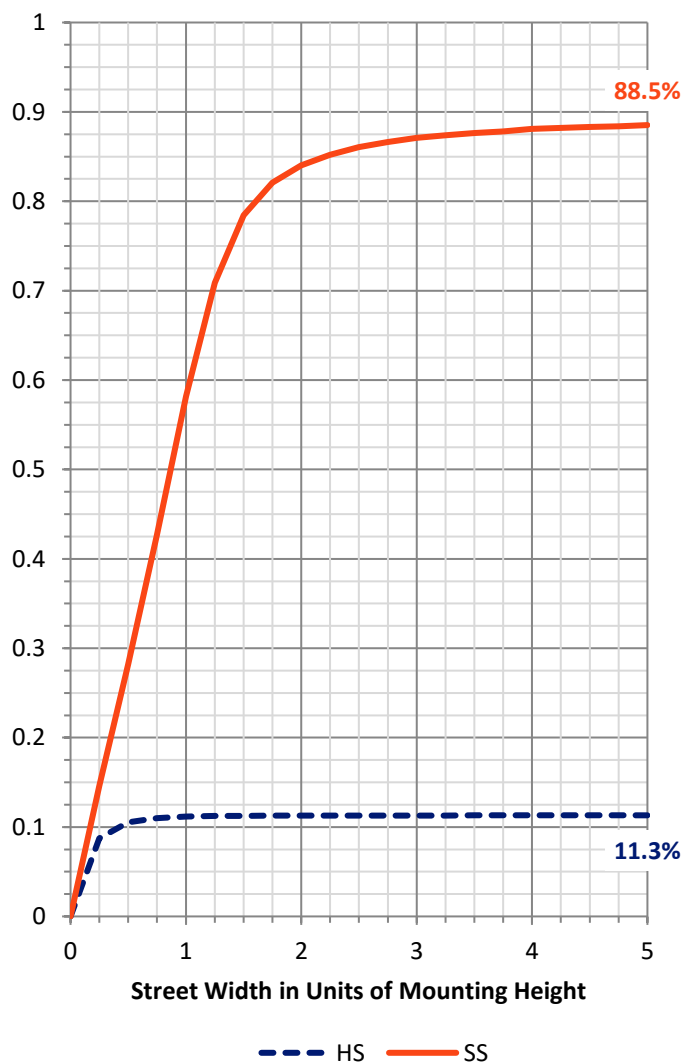
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 252.3    | 0.0    | 252.3  |
|                    | % Fixture | 11.4     | 0.0    | 11.4   |
| <b>Street Side</b> | Lumens    | 1958.7   | 0.0    | 1958.7 |
|                    | % Fixture | 88.6     | 0.0    | 88.6   |
| <b>Total</b>       | Lumens    | 2211.0   | 0.0    | 2211.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 44.0   | 2.0       |
| 10°-20°   | 95.3   | 4.3       |
| 20°-30°   | 136.5  | 6.2       |
| 30°-40°   | 200.9  | 9.1       |
| 40°-50°   | 331.9  | 15.0      |
| 50°-60°   | 533.9  | 24.1      |
| 60°-70°   | 582.2  | 26.3      |
| 70°-80°   | 264.9  | 12.0      |
| 80°-90°   | 21.3   | 1.0       |
| 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°    | 2211.0 | 100.0     |
| 0°-180°   | 2211.0 | 100.0     |

**Coefficient of Utilization**

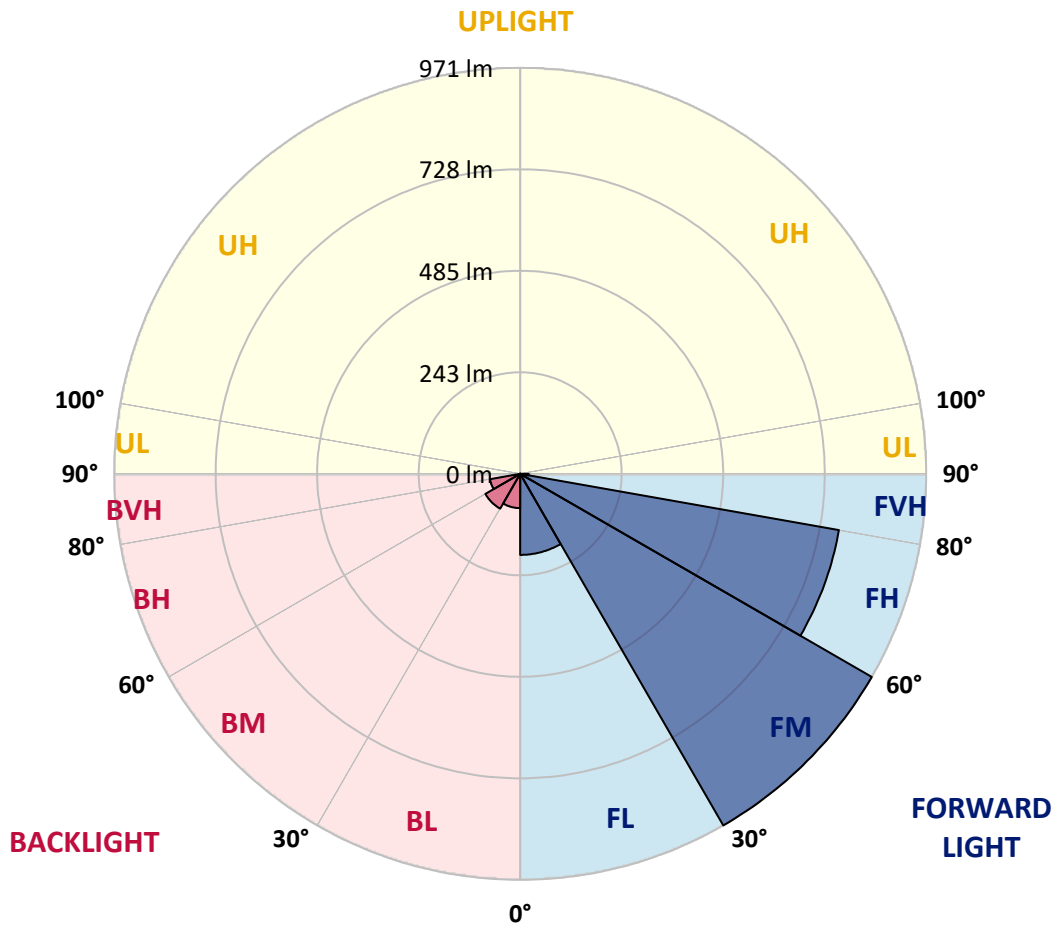


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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 193.8  | 8.8       |                         |      |         |
| FM (30°-60°)   | 970.7  | 43.9      |                         |      |         |
| FH (60°-80°)   | 773.9  | 35.0      |                         |      | G1/1800 |
| FVH (80°-90°)  | 20.3   | 0.9       |                         |      | G1/100  |
| BL (0°-30°)    | 82.0   | 3.7       | B0/110                  |      |         |
| BM (30°-60°)   | 96.1   | 4.3       | B0/220                  |      |         |
| BH (60°-80°)   | 73.2   | 3.3       | B0/110                  |      | G0/110  |
| BVH (80°-90°)  | 1.1    | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**  
 Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°    | 45°    | 55°    | 65°    | 67°    | 75°    | 85°    |
|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 539.5 | 539.5 | 539.5 | 539.5 | 539.5  | 539.5  | 539.5  | 539.5  | 539.5  | 539.5  | 539.5  |
| 2.5°  | 532.7 | 537.6 | 538.5 | 540.5 | 540.5  | 543.4  | 544.4  | 546.3  | 545.3  | 546.3  | 544.4  |
| 5°    | 495.8 | 499.7 | 497.8 | 507.5 | 513.3  | 524.0  | 534.6  | 543.4  | 543.4  | 546.3  | 545.3  |
| 7.5°  | 459.0 | 462.8 | 462.8 | 470.6 | 480.3  | 495.8  | 513.3  | 533.7  | 535.6  | 545.3  | 542.4  |
| 10°   | 429.9 | 431.8 | 433.7 | 442.5 | 454.1  | 469.6  | 492.9  | 519.1  | 523.0  | 539.5  | 540.5  |
| 12.5° | 406.6 | 409.5 | 412.4 | 421.1 | 431.8  | 447.3  | 469.6  | 499.7  | 506.5  | 529.8  | 538.5  |
| 15°   | 394.9 | 394.9 | 397.8 | 405.6 | 415.3  | 431.8  | 452.2  | 487.1  | 492.9  | 524.0  | 537.6  |
| 17.5° | 389.1 | 390.1 | 392.0 | 395.9 | 403.7  | 417.2  | 439.6  | 473.5  | 481.3  | 519.1  | 537.6  |
| 20°   | 396.9 | 396.9 | 394.0 | 395.9 | 399.8  | 410.4  | 430.8  | 463.8  | 473.5  | 516.2  | 542.4  |
| 22.5° | 413.4 | 413.4 | 408.5 | 405.6 | 402.7  | 406.6  | 425.0  | 459.9  | 468.7  | 516.2  | 545.3  |
| 25°   | 438.6 | 438.6 | 435.7 | 426.9 | 414.3  | 411.4  | 426.0  | 459.0  | 465.8  | 517.2  | 549.2  |
| 27.5° | 468.7 | 469.6 | 466.7 | 457.0 | 437.6  | 421.1  | 428.9  | 457.0  | 464.8  | 516.2  | 551.1  |
| 30°   | 508.5 | 512.3 | 508.5 | 494.9 | 471.6  | 440.5  | 435.7  | 456.1  | 463.8  | 514.3  | 552.1  |
| 32.5° | 548.2 | 551.1 | 555.0 | 546.3 | 513.3  | 470.6  | 450.2  | 459.9  | 466.7  | 515.2  | 550.2  |
| 35°   | 587.0 | 594.8 | 601.6 | 604.5 | 570.6  | 513.3  | 474.5  | 468.7  | 471.6  | 518.2  | 550.2  |
| 37.5° | 628.8 | 636.5 | 651.1 | 665.6 | 637.5  | 560.8  | 510.4  | 488.1  | 488.1  | 527.9  | 556.0  |
| 40°   | 682.1 | 686.0 | 714.2 | 731.6 | 718.0  | 637.5  | 561.8  | 521.1  | 520.1  | 555.0  | 572.5  |
| 42.5° | 733.6 | 744.2 | 781.1 | 807.3 | 798.6  | 727.7  | 623.9  | 579.3  | 569.6  | 598.7  | 602.6  |
| 45°   | 808.3 | 824.8 | 853.9 | 892.7 | 901.4  | 828.7  | 720.0  | 654.0  | 644.3  | 663.7  | 653.0  |
| 47.5° | 878.1 | 889.8 | 917.9 | 967.4 | 1017.9 | 958.7  | 828.7  | 758.8  | 750.1  | 757.8  | 740.4  |
| 50°   | 900.5 | 906.3 | 938.3 | 999.4 | 1118.8 | 1145.0 | 978.1  | 894.6  | 893.7  | 887.8  | 858.7  |
| 52.5° | 861.6 | 862.6 | 899.5 | 974.2 | 1160.5 | 1348.8 | 1189.6 | 1070.3 | 1053.8 | 1041.2 | 1002.3 |
| 55°   | 743.3 | 752.0 | 783.1 | 876.2 | 1119.8 | 1466.2 | 1528.3 | 1282.8 | 1255.6 | 1210.0 | 1161.5 |
| 57.5° | 581.2 | 577.3 | 602.6 | 688.0 | 994.6  | 1512.7 | 1862.1 | 1552.5 | 1484.6 | 1347.8 | 1282.8 |
| 60°   | 423.1 | 413.4 | 429.9 | 478.4 | 722.9  | 1421.5 | 2055.1 | 1932.9 | 1816.4 | 1496.2 | 1432.2 |
| 62.5° | 314.4 | 314.4 | 331.9 | 354.2 | 443.4  | 1109.1 | 2085.2 | 2368.6 | 2237.6 | 1684.5 | 1590.4 |
| 65°   | 251.3 | 250.3 | 264.9 | 298.9 | 316.3  | 688.0  | 1933.9 | 2679.1 | 2629.6 | 1880.5 | 1694.2 |
| 67.5° | 200.9 | 200.9 | 213.5 | 260.0 | 284.3  | 391.0  | 1496.2 | 2688.8 | 2703.3 | 1993.0 | 1631.1 |
| 70°   | 141.7 | 146.5 | 162.0 | 217.4 | 274.6  | 298.9  | 907.3  | 2309.4 | 2347.2 | 1959.1 | 1463.3 |
| 72.5° | 79.6  | 83.4  | 111.6 | 161.1 | 263.9  | 287.2  | 507.5  | 1744.6 | 1808.7 | 1641.8 | 1193.5 |
| 75°   | 37.8  | 41.7  | 65.0  | 110.6 | 220.3  | 273.6  | 308.6  | 1237.2 | 1228.4 | 1066.4 | 741.3  |
| 77.5° | 16.5  | 18.4  | 29.1  | 64.0  | 156.2  | 255.2  | 226.1  | 773.3  | 738.4  | 500.7  | 311.5  |
| 80°   | 5.8   | 6.8   | 12.6  | 36.9  | 88.3   | 208.6  | 188.2  | 357.1  | 323.1  | 138.8  | 81.5   |
| 82.5° | 1.0   | 1.0   | 4.9   | 17.5  | 39.8   | 116.4  | 155.3  | 170.8  | 147.5  | 34.9   | 34.9   |
| 85°   | 0.0   | 0.0   | 1.0   | 5.8   | 9.7    | 10.7   | 69.9   | 68.9   | 57.2   | 11.6   | 17.5   |
| 87.5° | 0.0   | 0.0   | 0.0   | 1.0   | 1.0    | 1.9    | 1.9    | 1.9    | 1.9    | 1.9    | 2.9    |
| 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: ISW-SA1A-750-U-SL2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 539.5  | 539.5 | 539.5 | 539.5 | 539.5 | 539.5 | 539.5 | 539.5 | 539.5 | 539.5 | 539.5 |
| 2.5°  | 539.5  | 538.5 | 528.8 | 520.1 | 508.5 | 498.7 | 490.0 | 481.3 | 477.4 | 478.4 | 480.3 |
| 5°    | 540.5  | 534.6 | 514.3 | 492.0 | 468.7 | 445.4 | 423.1 | 409.5 | 398.8 | 394.9 | 398.8 |
| 7.5°  | 535.6  | 525.9 | 494.9 | 459.0 | 422.1 | 381.3 | 347.4 | 322.1 | 303.7 | 292.1 | 296.9 |
| 10°   | 531.7  | 517.2 | 471.6 | 417.2 | 364.8 | 311.5 | 263.0 | 227.1 | 201.8 | 187.3 | 184.4 |
| 12.5° | 524.9  | 507.5 | 444.4 | 375.5 | 302.7 | 230.0 | 171.7 | 133.9 | 113.5 | 102.9 | 105.8 |
| 15°   | 523.0  | 495.8 | 417.2 | 327.0 | 236.8 | 155.3 | 103.8 | 82.5  | 73.7  | 71.8  | 71.8  |
| 17.5° | 521.1  | 488.1 | 388.1 | 279.5 | 169.8 | 97.0  | 71.8  | 66.0  | 64.0  | 63.1  | 64.0  |
| 20°   | 519.1  | 477.4 | 359.0 | 228.0 | 114.5 | 69.9  | 62.1  | 59.2  | 57.2  | 57.2  | 56.3  |
| 22.5° | 521.1  | 470.6 | 331.9 | 179.5 | 78.6  | 59.2  | 54.3  | 52.4  | 50.5  | 49.5  | 49.5  |
| 25°   | 519.1  | 461.9 | 298.9 | 132.0 | 61.1  | 52.4  | 48.5  | 44.6  | 42.7  | 41.7  | 40.8  |
| 27.5° | 516.2  | 451.2 | 267.8 | 95.1  | 53.4  | 46.6  | 41.7  | 37.8  | 34.9  | 34.0  | 34.0  |
| 30°   | 513.3  | 437.6 | 231.9 | 69.9  | 48.5  | 41.7  | 35.9  | 32.0  | 29.1  | 27.2  | 27.2  |
| 32.5° | 505.5  | 425.0 | 197.0 | 56.3  | 43.7  | 36.9  | 31.1  | 26.2  | 24.3  | 23.3  | 23.3  |
| 35°   | 500.7  | 410.4 | 160.1 | 48.5  | 39.8  | 32.0  | 26.2  | 22.3  | 20.4  | 19.4  | 19.4  |
| 37.5° | 499.7  | 394.9 | 127.1 | 43.7  | 35.9  | 28.1  | 22.3  | 19.4  | 17.5  | 16.5  | 16.5  |
| 40°   | 503.6  | 387.2 | 98.0  | 39.8  | 31.1  | 24.3  | 19.4  | 16.5  | 14.6  | 13.6  | 13.6  |
| 42.5° | 519.1  | 386.2 | 74.7  | 35.9  | 28.1  | 21.3  | 17.5  | 13.6  | 11.6  | 10.7  | 10.7  |
| 45°   | 554.1  | 392.0 | 59.2  | 33.0  | 24.3  | 18.4  | 14.6  | 11.6  | 9.7   | 8.7   | 8.7   |
| 47.5° | 611.3  | 416.3 | 49.5  | 30.1  | 20.4  | 15.5  | 11.6  | 9.7   | 6.8   | 6.8   | 6.8   |
| 50°   | 704.5  | 467.7 | 43.7  | 26.2  | 17.5  | 12.6  | 9.7   | 6.8   | 4.9   | 4.9   | 4.9   |
| 52.5° | 842.2  | 546.3 | 39.8  | 23.3  | 14.6  | 10.7  | 7.8   | 4.9   | 3.9   | 3.9   | 3.9   |
| 55°   | 984.9  | 644.3 | 36.9  | 19.4  | 12.6  | 8.7   | 5.8   | 3.9   | 2.9   | 2.9   | 1.9   |
| 57.5° | 1114.9 | 724.8 | 33.0  | 16.5  | 9.7   | 6.8   | 3.9   | 2.9   | 1.9   | 1.9   | 1.9   |
| 60°   | 1269.2 | 805.4 | 28.1  | 12.6  | 7.8   | 4.9   | 2.9   | 1.9   | 1.0   | 1.0   | 1.0   |
| 62.5° | 1418.6 | 851.0 | 23.3  | 9.7   | 5.8   | 3.9   | 1.9   | 1.0   | 1.0   | 1.0   | 1.0   |
| 65°   | 1483.6 | 829.6 | 18.4  | 7.8   | 4.9   | 2.9   | 1.0   | 1.0   | 1.0   | 0.0   | 0.0   |
| 67.5° | 1396.3 | 701.5 | 14.6  | 5.8   | 3.9   | 1.9   | 1.0   | 1.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 1202.2 | 567.6 | 11.6  | 4.9   | 2.9   | 1.0   | 1.0   | 1.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 944.1  | 418.2 | 9.7   | 3.9   | 1.9   | 1.0   | 1.0   | 1.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 574.4  | 210.6 | 8.7   | 2.9   | 1.9   | 1.9   | 1.0   | 1.0   | 1.0   | 0.0   | 0.0   |
| 77.5° | 195.0  | 66.0  | 5.8   | 2.9   | 1.9   | 1.9   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   |
| 80°   | 57.2   | 21.3  | 4.9   | 1.9   | 1.9   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   |
| 82.5° | 30.1   | 9.7   | 2.9   | 1.9   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   |
| 85°   | 16.5   | 4.9   | 1.9   | 1.0   | 1.0   | 1.0   | 0.0   | 0.0   | 1.0   | 1.0   | 1.0   |
| 87.5° | 2.9    | 1.9   | 1.9   | 1.0   | 1.0   | 1.0   | 0.0   | 0.0   | 0.0   | 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   |



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  
 CIE u': 0.2101  
 CIE v': 0.4904  
 Duv: 0.0037  
 CIE x: 0.3493  
 CIE y: 0.3624  
 CIE z: 0.2884  
 Peak Wavelength (nm): 444  
 Dominant Wavelength (nm): 571  
 Purity: 13.7  
 Rf: 74.9  
 Rg: 96.3

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 73.5 |      |       |
| R1:       | 70.5 | R9:  | -28.4 |
| R2:       | 77.7 | R10: | 48.6  |
| R3:       | 84.6 | R11: | 73.2  |
| R4:       | 74.7 | R12: | 50.7  |
| R5:       | 71.9 | R13: | 71.2  |
| R6:       | 70.7 | R14: | 91.4  |
| R7:       | 81.2 |      |       |
| R8:       | 56.9 |      |       |



**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)