

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: P438512

Luminaire Tested: **ISW-SA1D-730-U-T2-HSS**

Issue Date: 12/10/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P438512  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-7)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/10/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: ISW-SA1D-730-U-T2-HSS  
Description: IMPACT ELITE LED WEDGE LUMINAIRE  
(1) 70 CRI, 3000K, 800mA LIGHTSQUARE WITH 16 LEDS AND TYPE II OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

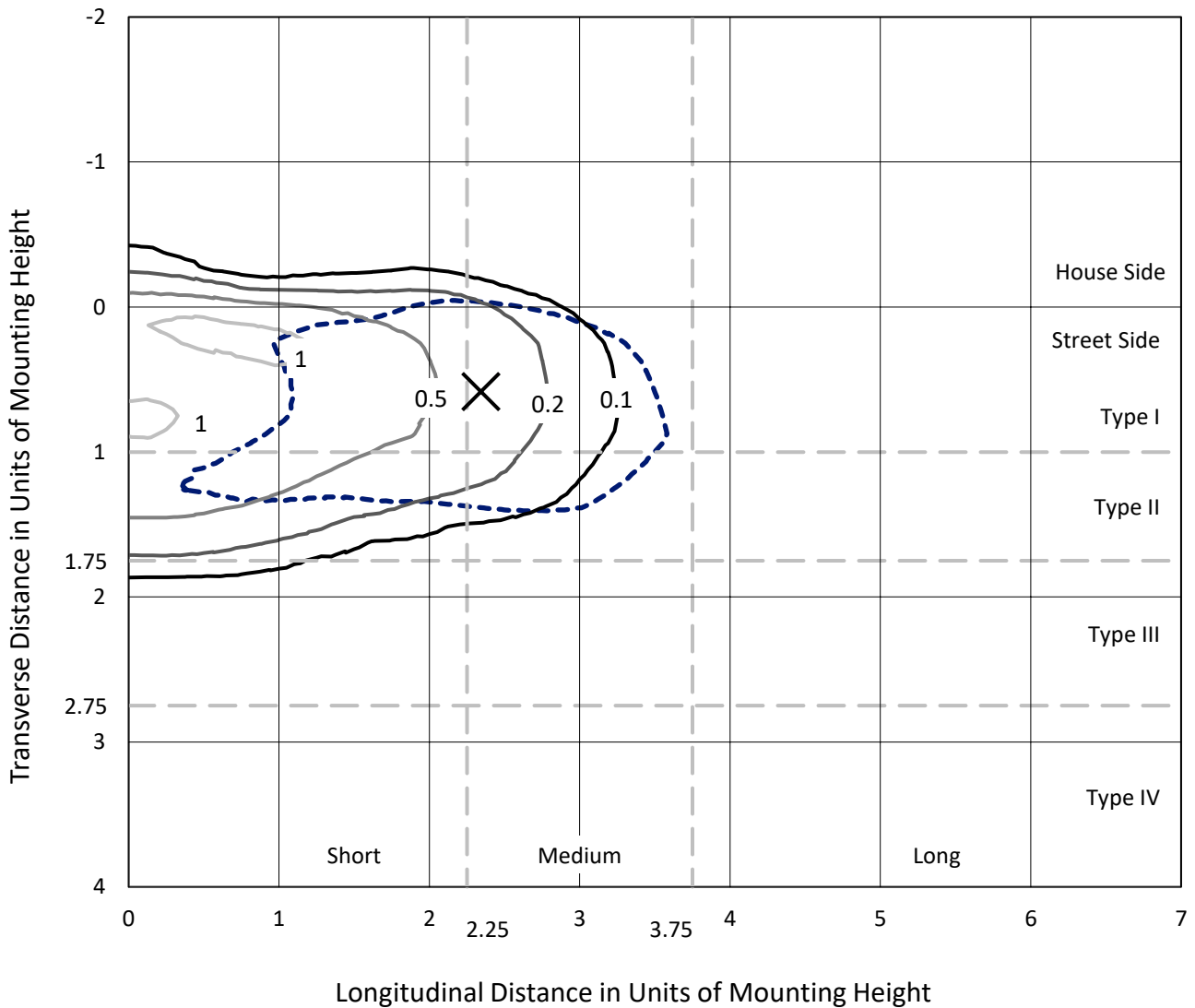
Lumens per Lamp: N/A  
Luminaire Lumens: 3852 lumens  
Efficiency: N/A  
Efficacy: 85.2 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B0 - U0 - G1  
  
Input Watts (W): 45.2  
Input Voltage (V): NR  
Input Current (Ain): NR  
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



REPORT NUMBER: P438512  
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### Iso-Footcandle Lines of Horizontal Illumination

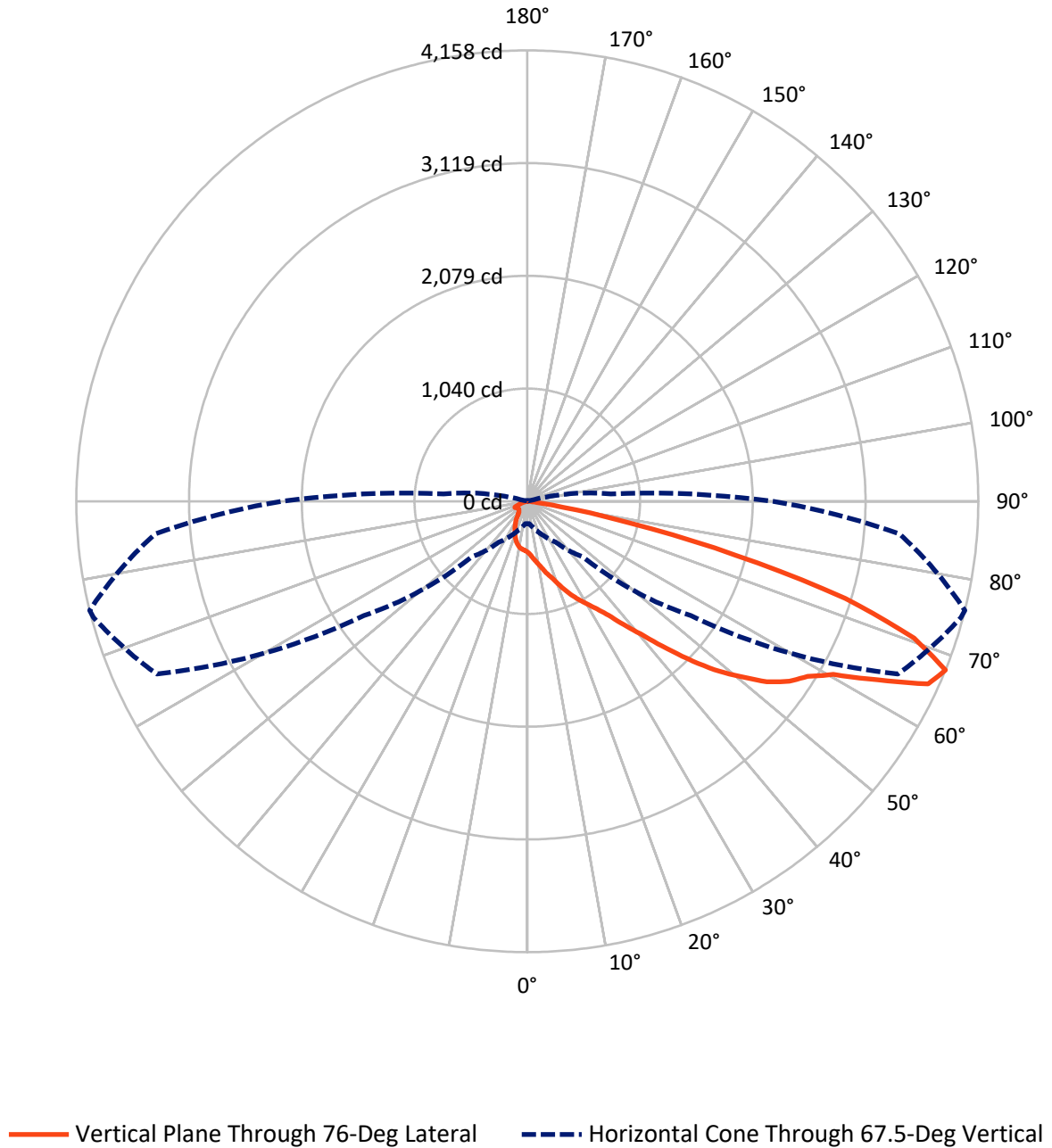
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.2 fc  
 Type II - Medium - N/A

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CATALOG NUMBER: ISW-SA1D-730-U-T2-HSS

### Luminous Intensity Polar Plot



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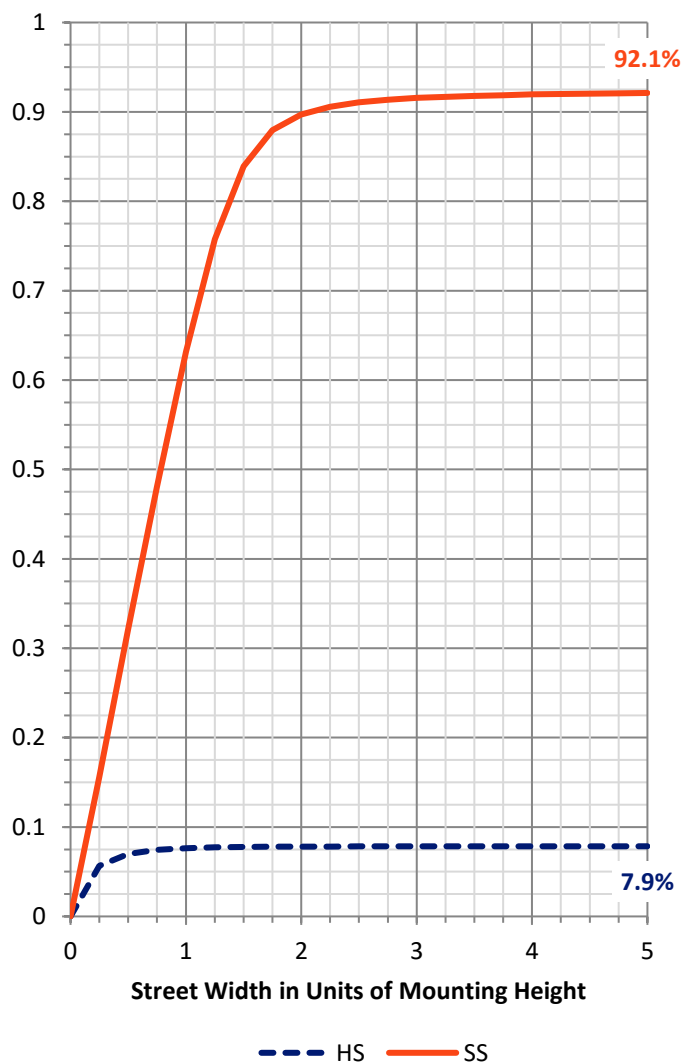
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 304.7    | 0.0    | 304.7  |
|                    | % Fixture | 7.9      | 0.0    | 7.9    |
| <b>Street Side</b> | Lumens    | 3547.2   | 0.0    | 3547.2 |
|                    | % Fixture | 92.1     | 0.0    | 92.1   |
| <b>Total</b>       | Lumens    | 3852.0   | 0.0    | 3852.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 44.9   | 1.2       |
| 10°-20°   | 125.2  | 3.2       |
| 20°-30°   | 216.0  | 5.6       |
| 30°-40°   | 384.8  | 10.0      |
| 40°-50°   | 685.2  | 17.8      |
| 50°-60°   | 1027.5 | 26.7      |
| 60°-70°   | 973.2  | 25.3      |
| 70°-80°   | 379.3  | 9.8       |
| 80°-90°   | 15.7   | 0.4       |
| 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°    | 3852.0 | 100.0     |
| 0°-180°   | 3852.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P438512

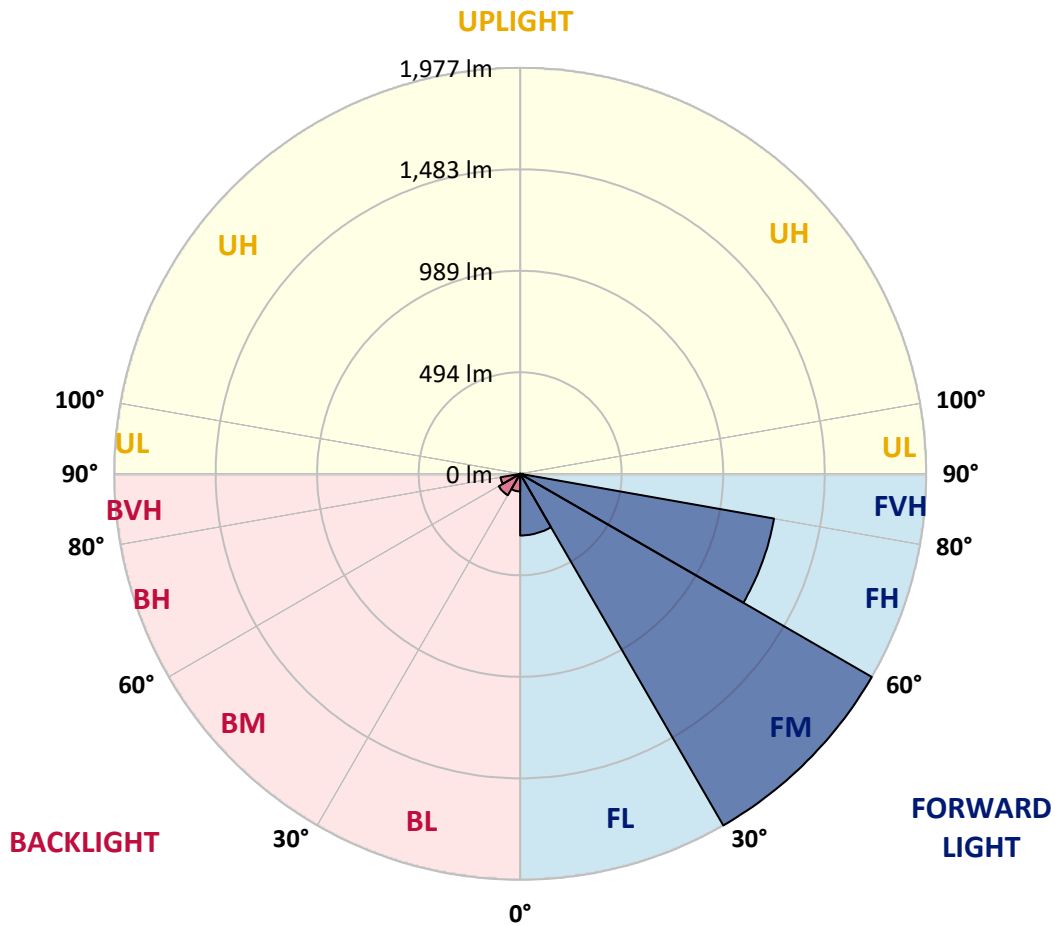
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 300.3  | 7.8       |                         |      |         |
| FM (30°-60°)   | 1977.3 | 51.3      |                         |      |         |
| FH (60°-80°)   | 1255.3 | 32.6      |                         |      | G1/1800 |
| FVH (80°-90°)  | 14.3   | 0.4       |                         |      | G1/100  |
| BL (0°-30°)    | 85.8   | 2.2       | B0/110                  |      |         |
| BM (30°-60°)   | 120.3  | 3.1       | B0/220                  |      |         |
| BH (60°-80°)   | 97.3   | 2.5       | B0/110                  |      | G0/110  |
| BVH (80°-90°)  | 1.4    | 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 Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 468.4  | 468.4  | 468.4  | 468.4  | 468.4  | 468.4  | 468.4  | 468.4  | 468.4  | 468.4  | 468.4  |
| 2.5°  | 554.9  | 549.5  | 545.9  | 544.1  | 540.5  | 529.7  | 520.7  | 504.5  | 490.1  | 490.1  | 481.1  |
| 5°    | 605.4  | 603.6  | 596.4  | 592.8  | 591.0  | 583.7  | 567.5  | 547.7  | 524.3  | 522.5  | 500.9  |
| 7.5°  | 619.8  | 621.6  | 621.6  | 625.2  | 627.0  | 623.4  | 609.0  | 591.0  | 560.3  | 556.7  | 524.3  |
| 10°   | 614.4  | 614.4  | 619.8  | 630.6  | 645.0  | 652.2  | 650.4  | 636.0  | 600.0  | 596.4  | 551.3  |
| 12.5° | 594.6  | 598.2  | 607.2  | 625.2  | 652.2  | 673.8  | 686.4  | 681.0  | 645.0  | 641.4  | 587.4  |
| 15°   | 567.5  | 571.1  | 587.4  | 612.6  | 648.6  | 690.0  | 718.9  | 735.1  | 699.1  | 695.5  | 625.2  |
| 17.5° | 529.7  | 533.3  | 551.3  | 589.2  | 639.6  | 697.3  | 753.1  | 785.5  | 754.9  | 744.1  | 664.8  |
| 20°   | 515.3  | 518.9  | 533.3  | 563.9  | 623.4  | 697.3  | 783.7  | 845.0  | 821.6  | 812.6  | 715.3  |
| 22.5° | 572.9  | 571.1  | 558.5  | 562.1  | 607.2  | 691.8  | 807.2  | 918.9  | 900.8  | 888.2  | 769.3  |
| 25°   | 677.4  | 684.6  | 666.6  | 625.2  | 618.0  | 686.4  | 823.4  | 976.5  | 974.7  | 962.1  | 825.2  |
| 27.5° | 798.1  | 801.8  | 781.9  | 738.7  | 679.2  | 697.3  | 841.4  | 1034.2 | 1043.2 | 1032.4 | 868.4  |
| 30°   | 897.2  | 909.9  | 895.4  | 855.8  | 792.7  | 744.1  | 854.0  | 1086.4 | 1117.0 | 1102.6 | 909.9  |
| 32.5° | 1039.6 | 1045.0 | 1030.6 | 972.9  | 908.1  | 834.2  | 877.4  | 1131.5 | 1198.1 | 1185.5 | 958.5  |
| 35°   | 1189.1 | 1196.3 | 1169.3 | 1106.2 | 1027.0 | 944.1  | 933.3  | 1192.7 | 1315.2 | 1290.0 | 1032.4 |
| 37.5° | 1322.4 | 1329.6 | 1317.0 | 1239.6 | 1162.1 | 1073.8 | 1032.4 | 1275.6 | 1457.6 | 1441.4 | 1124.3 |
| 40°   | 1428.7 | 1446.8 | 1443.2 | 1376.5 | 1304.4 | 1225.2 | 1174.7 | 1372.9 | 1621.5 | 1607.1 | 1241.4 |
| 42.5° | 1536.8 | 1549.5 | 1542.2 | 1493.6 | 1443.2 | 1394.5 | 1331.5 | 1508.0 | 1832.3 | 1825.1 | 1387.3 |
| 45°   | 1672.0 | 1691.8 | 1682.8 | 1643.1 | 1581.9 | 1571.1 | 1511.6 | 1670.2 | 2082.8 | 2071.9 | 1563.9 |
| 47.5° | 1872.0 | 1890.0 | 1875.6 | 1821.5 | 1751.2 | 1731.4 | 1681.0 | 1853.9 | 2327.8 | 2322.4 | 1738.6 |
| 50°   | 1980.1 | 1998.1 | 2035.9 | 2044.9 | 1998.1 | 1891.8 | 1832.3 | 2028.7 | 2547.6 | 2538.6 | 1906.2 |
| 52.5° | 1942.2 | 1958.4 | 2050.3 | 2136.8 | 2239.5 | 2149.4 | 2016.1 | 2217.9 | 2749.4 | 2765.6 | 2070.1 |
| 55°   | 1780.1 | 1801.7 | 1933.2 | 2071.9 | 2320.6 | 2441.3 | 2288.1 | 2432.3 | 2907.9 | 2931.4 | 2178.2 |
| 57.5° | 1452.2 | 1477.4 | 1646.7 | 1861.1 | 2196.3 | 2515.2 | 2625.1 | 2727.8 | 3016.0 | 3046.7 | 2317.0 |
| 60°   | 870.2  | 909.9  | 1084.6 | 1369.3 | 1834.1 | 2340.4 | 2864.7 | 3153.0 | 3226.8 | 3241.2 | 2612.5 |
| 62.5° | 482.9  | 473.8  | 614.4  | 848.6  | 1264.8 | 1900.8 | 2828.7 | 3670.0 | 3625.0 | 3625.0 | 3116.9 |
| 65°   | 290.1  | 299.1  | 371.1  | 504.5  | 735.1  | 1254.0 | 2522.4 | 3988.9 | 4048.4 | 4061.0 | 3525.9 |
| 67.5° | 205.4  | 207.2  | 259.4  | 345.9  | 459.4  | 722.5  | 1839.5 | 3769.1 | 4140.3 | 4158.3 | 3444.8 |
| 70°   | 133.3  | 135.1  | 185.6  | 246.8  | 327.9  | 398.2  | 1124.3 | 3106.1 | 3792.6 | 3783.6 | 3046.7 |
| 72.5° | 81.1   | 84.7   | 117.1  | 182.0  | 252.2  | 225.2  | 605.4  | 2244.9 | 3005.2 | 3066.5 | 2390.8 |
| 75°   | 50.4   | 54.1   | 70.3   | 126.1  | 176.6  | 153.1  | 266.7  | 1499.0 | 1938.6 | 1985.5 | 1544.0 |
| 77.5° | 28.8   | 32.4   | 45.0   | 72.1   | 126.1  | 106.3  | 126.1  | 787.3  | 938.7  | 969.3  | 619.8  |
| 80°   | 10.8   | 12.6   | 23.4   | 36.0   | 77.5   | 64.9   | 57.7   | 266.7  | 299.1  | 335.1  | 189.2  |
| 82.5° | 1.8    | 3.6    | 10.8   | 21.6   | 30.6   | 30.6   | 25.2   | 81.1   | 82.9   | 88.3   | 50.4   |
| 85°   | 0.0    | 0.0    | 3.6    | 5.4    | 5.4    | 5.4    | 9.0    | 16.2   | 25.2   | 25.2   | 14.4   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 1.8    | 1.8    | 1.8    | 3.6    | 3.6    | 3.6    | 3.6    |
| 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-SA1D-730-U-T2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 468.4  | 468.4 | 468.4 | 468.4 | 468.4 | 468.4 | 468.4 | 468.4 | 468.4 | 468.4 | 468.4 |
| 2.5°  | 472.0  | 468.4 | 454.0 | 439.6 | 428.8 | 419.8 | 405.4 | 405.4 | 400.0 | 394.6 | 396.4 |
| 5°    | 484.7  | 473.8 | 446.8 | 419.8 | 394.6 | 371.1 | 351.3 | 342.3 | 329.7 | 326.1 | 324.3 |
| 7.5°  | 500.9  | 481.1 | 436.0 | 392.8 | 351.3 | 320.7 | 295.5 | 279.3 | 264.8 | 261.2 | 263.0 |
| 10°   | 520.7  | 491.9 | 423.4 | 356.7 | 306.3 | 268.5 | 239.6 | 227.0 | 210.8 | 205.4 | 200.0 |
| 12.5° | 549.5  | 504.5 | 403.6 | 317.1 | 261.2 | 223.4 | 182.0 | 151.3 | 140.5 | 136.9 | 136.9 |
| 15°   | 572.9  | 511.7 | 378.4 | 279.3 | 223.4 | 164.0 | 129.7 | 124.3 | 122.5 | 122.5 | 122.5 |
| 17.5° | 600.0  | 517.1 | 347.7 | 243.2 | 173.0 | 120.7 | 113.5 | 113.5 | 111.7 | 111.7 | 109.9 |
| 20°   | 628.8  | 518.9 | 315.3 | 210.8 | 122.5 | 108.1 | 102.7 | 100.9 | 97.3  | 95.5  | 95.5  |
| 22.5° | 661.2  | 517.1 | 279.3 | 173.0 | 108.1 | 99.1  | 90.1  | 86.5  | 82.9  | 79.3  | 79.3  |
| 25°   | 688.2  | 513.5 | 246.8 | 124.3 | 99.1  | 86.5  | 77.5  | 72.1  | 68.5  | 66.7  | 64.9  |
| 27.5° | 711.7  | 493.7 | 214.4 | 106.3 | 90.1  | 77.5  | 66.7  | 61.3  | 57.7  | 55.9  | 55.9  |
| 30°   | 713.5  | 461.2 | 187.4 | 99.1  | 82.9  | 68.5  | 57.7  | 54.1  | 52.2  | 50.4  | 50.4  |
| 32.5° | 724.3  | 428.8 | 158.5 | 93.7  | 73.9  | 61.3  | 52.2  | 48.6  | 45.0  | 45.0  | 45.0  |
| 35°   | 745.9  | 400.0 | 122.5 | 84.7  | 66.7  | 54.1  | 46.8  | 43.2  | 41.4  | 39.6  | 39.6  |
| 37.5° | 780.1  | 380.2 | 100.9 | 77.5  | 61.3  | 48.6  | 43.2  | 39.6  | 37.8  | 36.0  | 36.0  |
| 40°   | 825.2  | 369.3 | 91.9  | 70.3  | 54.1  | 45.0  | 39.6  | 36.0  | 32.4  | 30.6  | 30.6  |
| 42.5° | 902.6  | 369.3 | 84.7  | 63.1  | 48.6  | 41.4  | 36.0  | 32.4  | 28.8  | 27.0  | 27.0  |
| 45°   | 992.7  | 383.8 | 79.3  | 55.9  | 43.2  | 37.8  | 32.4  | 27.0  | 23.4  | 21.6  | 21.6  |
| 47.5° | 1091.8 | 410.8 | 73.9  | 50.4  | 39.6  | 34.2  | 28.8  | 21.6  | 18.0  | 16.2  | 16.2  |
| 50°   | 1207.1 | 450.4 | 70.3  | 45.0  | 36.0  | 30.6  | 23.4  | 16.2  | 14.4  | 12.6  | 12.6  |
| 52.5° | 1304.4 | 490.1 | 64.9  | 41.4  | 32.4  | 27.0  | 18.0  | 14.4  | 10.8  | 10.8  | 10.8  |
| 55°   | 1396.3 | 533.3 | 61.3  | 37.8  | 30.6  | 21.6  | 14.4  | 10.8  | 9.0   | 9.0   | 9.0   |
| 57.5° | 1518.8 | 587.4 | 55.9  | 34.2  | 25.2  | 16.2  | 12.6  | 9.0   | 7.2   | 7.2   | 7.2   |
| 60°   | 1769.3 | 708.1 | 48.6  | 30.6  | 21.6  | 14.4  | 10.8  | 9.0   | 7.2   | 5.4   | 5.4   |
| 62.5° | 2176.4 | 904.4 | 41.4  | 27.0  | 16.2  | 12.6  | 9.0   | 7.2   | 5.4   | 3.6   | 3.6   |
| 65°   | 2434.1 | 953.1 | 34.2  | 21.6  | 12.6  | 9.0   | 7.2   | 5.4   | 3.6   | 1.8   | 1.8   |
| 67.5° | 2268.3 | 774.7 | 27.0  | 16.2  | 10.8  | 7.2   | 5.4   | 3.6   | 1.8   | 0.0   | 0.0   |
| 70°   | 1915.2 | 585.5 | 19.8  | 10.8  | 9.0   | 5.4   | 3.6   | 1.8   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1513.4 | 445.0 | 18.0  | 9.0   | 7.2   | 3.6   | 3.6   | 1.8   | 0.0   | 0.0   | 0.0   |
| 75°   | 992.7  | 228.8 | 14.4  | 9.0   | 5.4   | 3.6   | 1.8   | 1.8   | 0.0   | 0.0   | 0.0   |
| 77.5° | 391.0  | 86.5  | 10.8  | 7.2   | 5.4   | 3.6   | 1.8   | 1.8   | 0.0   | 0.0   | 0.0   |
| 80°   | 106.3  | 28.8  | 5.4   | 3.6   | 3.6   | 1.8   | 1.8   | 1.8   | 0.0   | 0.0   | 0.0   |
| 82.5° | 27.0   | 12.6  | 3.6   | 3.6   | 1.8   | 1.8   | 1.8   | 1.8   | 1.8   | 0.0   | 0.0   |
| 85°   | 9.0    | 3.6   | 3.6   | 1.8   | 1.8   | 1.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 3.6    | 3.6   | 3.6   | 1.8   | 1.8   | 1.8   | 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: SP1-1908-441-2-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-730-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

CCT (K): 2993  
 CIE u': 0.2508  
 CIE v': 0.5215  
 Duv: 0.0000  
 CIE x: 0.4374  
 CIE y: 0.4043  
 CIE z: 0.1583  
 Peak Wavelength (nm): 593  
 Dominant Wavelength (nm): 582  
 Purity: 53

|           |      |      |       |
|-----------|------|------|-------|
| CRI (Ra): | 71.8 |      |       |
| R1:       | 67.5 | R9:  | -38.3 |
| R2:       | 82.9 | R10: | 62.5  |
| R3:       | 94.7 | R11: | 63.7  |
| R4:       | 67.7 | R12: | 57.8  |
| R5:       | 67.9 | R13: | 70.4  |
| R6:       | 77.6 | R14: | 97.3  |
| R7:       | 76.0 |      |       |
| R8:       | 40.5 |      |       |

Rf: 75.7  
 Rg: 93.9



**Test Conditions**

Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-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            |

REPORT NUMBER: SP1-1908-441-2-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-2-R4

**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               | 2397                                 | NR                             | 490               | 24908                                | NR                             | 620               | 118784                               | NR                             | 750               | 5037                                 | NR                             | 880               | 2677                                 | NR                             |
| 365               | 2084                                 | NR                             | 495               | 30998                                | NR                             | 625               | 108951                               | NR                             | 755               | 4413                                 | NR                             | 885               | 2940                                 | NR                             |
| 370               | 2143                                 | NR                             | 500               | 37103                                | NR                             | 630               | 99573                                | NR                             | 760               | 4189                                 | NR                             | 890               | 3116                                 | NR                             |
| 375               | 2413                                 | NR                             | 505               | 42987                                | NR                             | 635               | 90444                                | NR                             | 765               | 3677                                 | NR                             | 895               | 3345                                 | NR                             |
| 380               | 2172                                 | NR                             | 510               | 48702                                | NR                             | 640               | 80749                                | NR                             | 770               | 3366                                 | NR                             | 900               | 2312                                 | NR                             |
| 385               | 1997                                 | NR                             | 515               | 53741                                | NR                             | 645               | 71664                                | NR                             | 775               | 3211                                 | NR                             | 905               | 2829                                 | NR                             |
| 390               | 1830                                 | NR                             | 520               | 57283                                | NR                             | 650               | 63936                                | NR                             | 780               | 2682                                 | NR                             | 910               | 2783                                 | NR                             |
| 395               | 1861                                 | NR                             | 525               | 61876                                | NR                             | 655               | 56611                                | NR                             | 785               | 2804                                 | NR                             | 915               | 2662                                 | NR                             |
| 400               | 1717                                 | NR                             | 530               | 65398                                | NR                             | 660               | 49763                                | NR                             | 790               | 2581                                 | NR                             | 920               | 3047                                 | NR                             |
| 405               | 1761                                 | NR                             | 535               | 69597                                | NR                             | 665               | 42891                                | NR                             | 795               | 2711                                 | NR                             | 925               | 2256                                 | NR                             |
| 410               | 2680                                 | NR                             | 540               | 74214                                | NR                             | 670               | 36939                                | NR                             | 800               | 2609                                 | NR                             | 930               | 2976                                 | NR                             |
| 415               | 4374                                 | NR                             | 545               | 79911                                | NR                             | 675               | 31946                                | NR                             | 805               | 2581                                 | NR                             | 935               | 3503                                 | NR                             |
| 420               | 8071                                 | NR                             | 550               | 86153                                | NR                             | 680               | 27385                                | NR                             | 810               | 2404                                 | NR                             | 940               | 4226                                 | NR                             |
| 425               | 15169                                | NR                             | 555               | 93952                                | NR                             | 685               | 23504                                | NR                             | 815               | 2556                                 | NR                             | 945               | 2930                                 | NR                             |
| 430               | 26038                                | NR                             | 560               | 102904                               | NR                             | 690               | 20210                                | NR                             | 820               | 2742                                 | NR                             | 950               | 2115                                 | NR                             |
| 435               | 41316                                | NR                             | 565               | 112009                               | NR                             | 695               | 17459                                | NR                             | 825               | 2014                                 | NR                             | 955               | 2634                                 | NR                             |
| 440               | 59674                                | NR                             | 570               | 121662                               | NR                             | 700               | 15207                                | NR                             | 830               | 2488                                 | NR                             | 960               | 4200                                 | NR                             |
| 445               | 72751                                | NR                             | 575               | 130476                               | NR                             | 705               | 13322                                | NR                             | 835               | 2625                                 | NR                             | 965               | 1982                                 | NR                             |
| 450               | 65091                                | NR                             | 580               | 137926                               | NR                             | 710               | 11676                                | NR                             | 840               | 2754                                 | NR                             | 970               | 3613                                 | NR                             |
| 455               | 44894                                | NR                             | 585               | 143406                               | NR                             | 715               | 10626                                | NR                             | 845               | 2708                                 | NR                             | 975               | 4034                                 | NR                             |
| 460               | 32712                                | NR                             | 590               | 147039                               | NR                             | 720               | 9416                                 | NR                             | 850               | 2608                                 | NR                             | 980               | 3922                                 | NR                             |
| 465               | 25296                                | NR                             | 595               | 147365                               | NR                             | 725               | 8333                                 | NR                             | 855               | 2605                                 | NR                             | 985               | 1909                                 | NR                             |
| 470               | 19318                                | NR                             | 600               | 145800                               | NR                             | 730               | 7134                                 | NR                             | 860               | 1765                                 | NR                             | 990               | 3617                                 | NR                             |
| 475               | 17265                                | NR                             | 605               | 141363                               | NR                             | 735               | 6437                                 | NR                             | 865               | 2581                                 | NR                             | 995               | 4767                                 | NR                             |
| 480               | 18260                                | NR                             | 610               | 134199                               | NR                             | 740               | 5834                                 | NR                             | 870               | 3016                                 | NR                             | 1000              | 2528                                 | NR                             |
| 485               | 20845                                | NR                             | 615               | 127683                               | NR                             | 745               | 5500                                 | NR                             | 875               | 3952                                 | NR                             |                   |                                      |                                |

REPORT NUMBER: SP1-1908-441-2-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| 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    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

REPORT NUMBER: SP1-1908-441-2-R4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 3101.5 M/P: 0.45

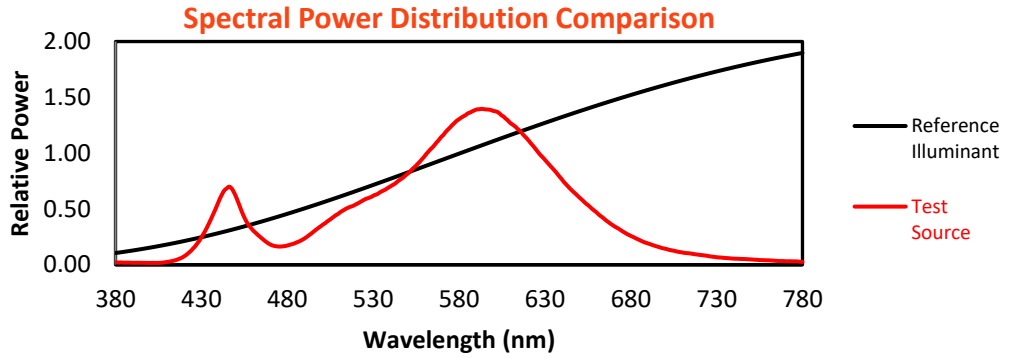
| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

REPORT NUMBER: SP1-1908-441-2-R4

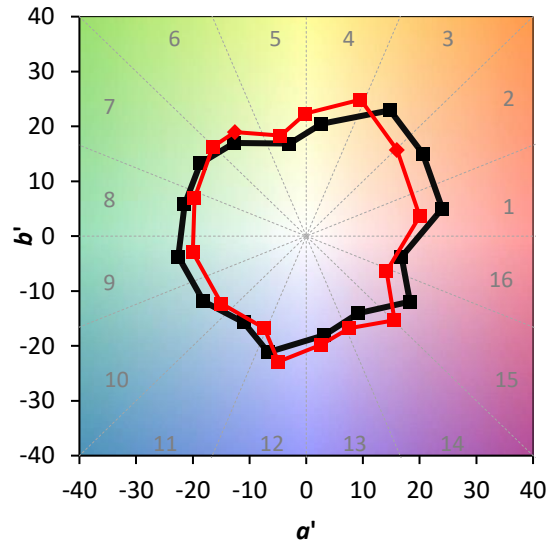
TM-30-18

**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 CIE  $R_a = 71.8$   
 $R_9 = -38.3$



**Color Vector Graphics**





REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

Measure Comparisons



(END OF REPORT)