

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



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P640609

Luminaire Tested: GWS-SA5E-730-U-AFL-W-HSS

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P640609  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-48)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA5E-730-U-AFL-W-HSS  
Description: GALLEON WALL SLIM LUMINAIRE. (5) LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE FRONTLINE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: (80) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

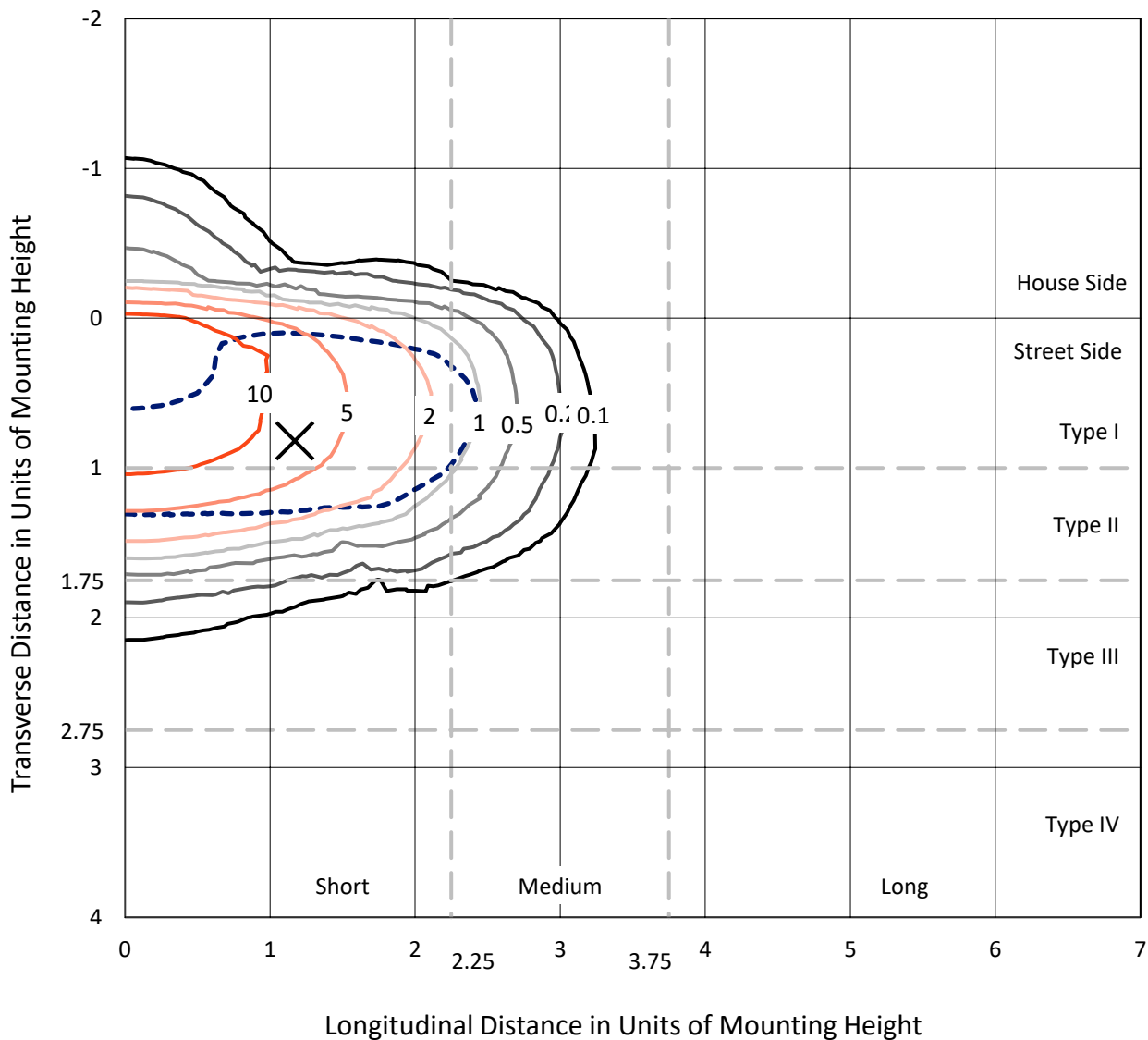
Lumens per Lamp: N/A  
Luminaire Lumens: 28667.5 lumens  
Efficiency: N/A  
Efficacy: 106.3 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G2  
  
Input Watts (W): 269.6  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P640609  
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### Iso-Footcandle Lines of Horizontal Illumination

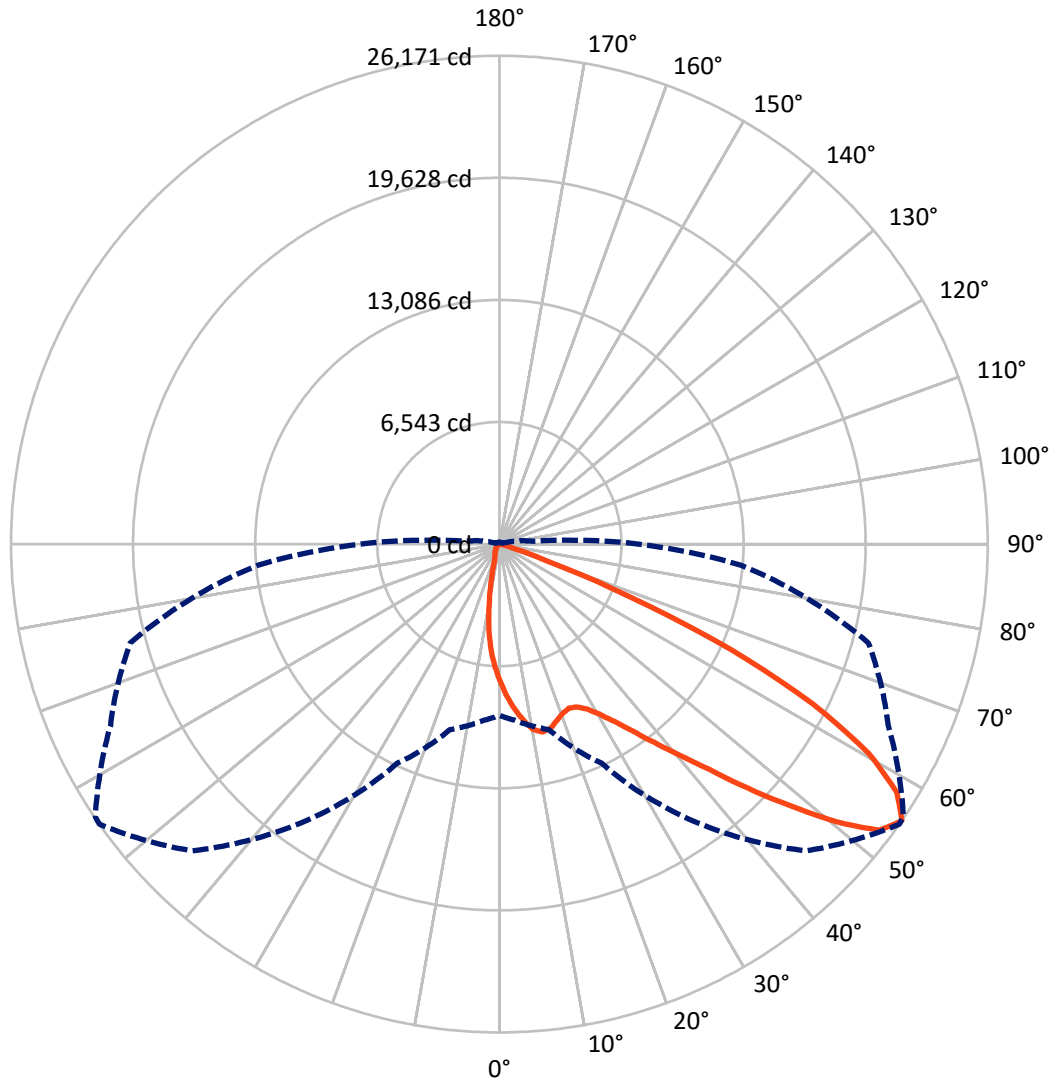
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 15.5 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 55-Deg Lateral    - - - Horizontal Cone Through 55-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 1768.9   | 0.0    | 1768.9  |
|                    | % Fixture | 6.2      | 0.0    | 6.2     |
| <b>Street Side</b> | Lumens    | 26898.6  | 0.0    | 26898.6 |
|                    | % Fixture | 93.8     | 0.0    | 93.8    |
| <b>Total</b>       | Lumens    | 28667.5  | 0.0    | 28667.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 654.5   | 2.3       |
| 10°-20°   | 1578.0  | 5.5       |
| 20°-30°   | 2627.9  | 9.2       |
| 30°-40°   | 4478.1  | 15.6      |
| 40°-50°   | 7309.8  | 25.5      |
| 50°-60°   | 7653.0  | 26.7      |
| 60°-70°   | 3860.0  | 13.5      |
| 70°-80°   | 487.6   | 1.7       |
| 80°-90°   | 18.5    | 0.1       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 28667.5 | 100.0     |
| 0°-180°   | 28667.5 | 100.0     |

**Coefficient of Utilization**



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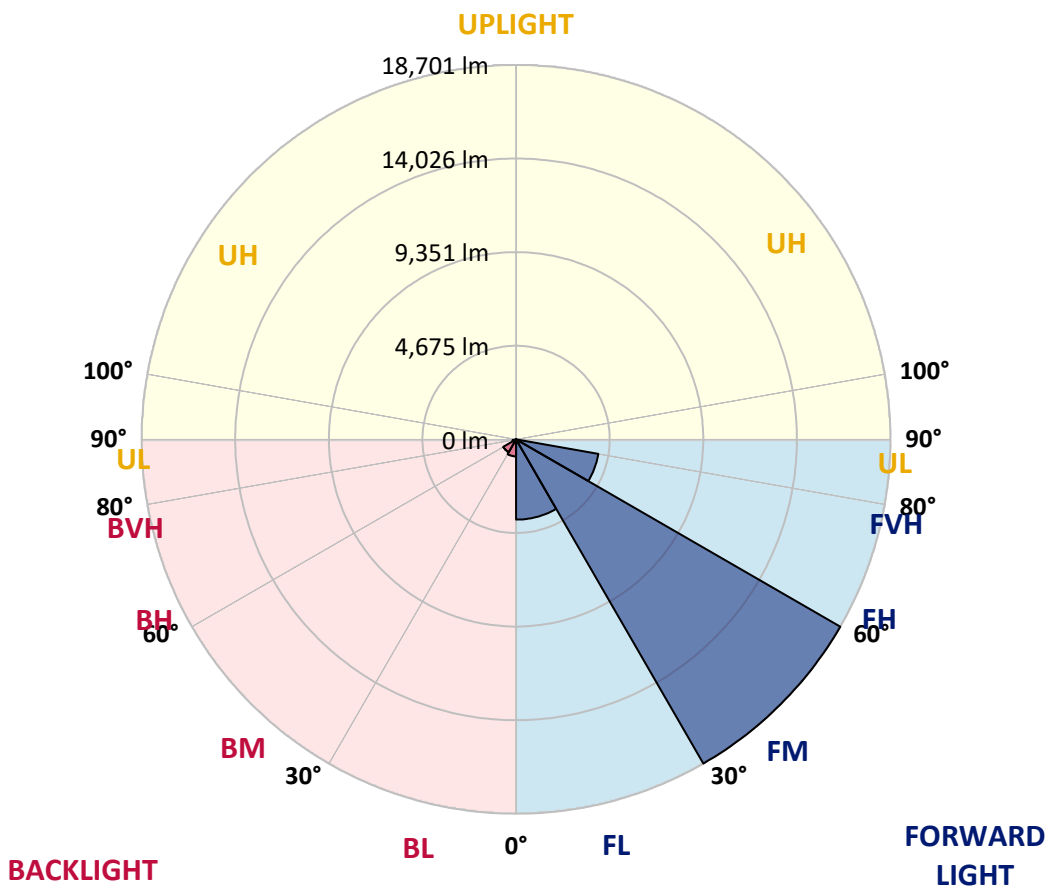
CATALOG NUMBER: GWS-SA5E-730-U-AFL-W-HSS

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

| Zone           | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|---------|-----------|-------------------------|------|---------|
|                |         |           | B                       | U    | G       |
| FL (0°-30°)    | 4010.2  | 14.0      |                         |      |         |
| FM (30°-60°)   | 18701.4 | 65.2      |                         |      |         |
| FH (60°-80°)   | 4170.2  | 14.5      |                         |      | G2/5000 |
| FVH (80°-90°)  | 16.8    | 0.1       |                         |      | G1/100  |
| BL (0°-30°)    | 850.2   | 3.0       | B2/1000                 |      |         |
| BM (30°-60°)   | 739.6   | 2.6       | B1/1000                 |      |         |
| BH (60°-80°)   | 177.5   | 0.6       | B1/500                  |      | G1/500  |
| BVH (80°-90°)  | 1.7     | 0.0       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0     | 0.0       |                         | U0/0 |         |

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

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 56°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 7406.0  | 7406.0  | 7406.0  | 7406.0  | 7406.0  | 7406.0  | 7406.0  | 7406.0  | 7406.0  | 7406.0  | 7406.0  |
| 2.5°  | 8633.8  | 8592.1  | 8655.9  | 8582.3  | 8457.4  | 8352.0  | 8214.7  | 8165.7  | 7945.2  | 7736.8  | 7535.9  |
| 5°    | 9682.7  | 9695.0  | 9675.3  | 9572.4  | 9396.0  | 9199.9  | 8923.0  | 8861.7  | 8477.0  | 8079.9  | 7651.1  |
| 7.5°  | 9942.5  | 9935.1  | 9976.8  | 10016.0 | 9986.6  | 9888.6  | 9587.1  | 9525.9  | 9048.0  | 8452.5  | 7827.5  |
| 10°   | 9141.1  | 9146.0  | 9231.8  | 9496.4  | 9824.8  | 10165.5 | 10118.9 | 10084.6 | 9616.5  | 8874.0  | 8023.6  |
| 12.5° | 8008.9  | 8053.0  | 8143.7  | 8521.1  | 9077.4  | 9851.8  | 10332.1 | 10366.4 | 10138.5 | 9337.2  | 8253.9  |
| 15°   | 7518.7  | 7528.5  | 7602.1  | 7830.0  | 8244.1  | 9199.9  | 10241.5 | 10337.0 | 10574.8 | 9802.8  | 8503.9  |
| 17.5° | 7506.5  | 7518.7  | 7550.6  | 7651.1  | 7920.6  | 8687.7  | 9949.8  | 10116.5 | 10903.1 | 10302.7 | 8802.9  |
| 20°   | 7967.2  | 7959.9  | 7937.8  | 7883.9  | 8001.5  | 8518.6  | 9680.2  | 9864.1  | 11082.0 | 10790.4 | 9104.3  |
| 22.5° | 8802.9  | 8793.1  | 8695.1  | 8472.1  | 8376.5  | 8673.0  | 9547.9  | 9714.6  | 11189.9 | 11224.2 | 9351.9  |
| 25°   | 9766.0  | 9834.6  | 9650.8  | 9312.6  | 9077.4  | 9067.6  | 9665.5  | 9783.2  | 11283.0 | 11608.9 | 9521.0  |
| 27.5° | 10822.3 | 10844.3 | 10687.5 | 10307.6 | 9967.0  | 9699.9  | 10006.2 | 10094.4 | 11385.9 | 11952.0 | 9616.5  |
| 30°   | 11981.5 | 11974.1 | 11795.2 | 11354.1 | 10939.9 | 10555.1 | 10579.7 | 10614.0 | 11626.1 | 12344.2 | 9721.9  |
| 32.5° | 13429.8 | 13461.7 | 13143.1 | 12542.7 | 12045.2 | 11513.4 | 11329.6 | 11334.5 | 12059.9 | 12849.0 | 9881.2  |
| 35°   | 15397.7 | 15319.3 | 14897.8 | 14042.5 | 13194.5 | 12621.1 | 12307.4 | 12280.4 | 12728.9 | 13527.8 | 10158.1 |
| 37.5° | 17272.5 | 17279.9 | 16838.7 | 15897.7 | 14826.7 | 13922.4 | 13478.8 | 13405.3 | 13670.0 | 14468.9 | 10618.9 |
| 40°   | 18573.8 | 18598.3 | 18414.5 | 17921.9 | 16787.3 | 15508.0 | 14856.1 | 14780.1 | 14890.4 | 15659.9 | 11221.7 |
| 42.5° | 19262.5 | 19331.1 | 19382.6 | 19497.7 | 18637.5 | 17488.2 | 16485.8 | 16478.5 | 16363.3 | 17017.6 | 11920.2 |
| 45°   | 19289.4 | 19392.4 | 19706.0 | 20492.7 | 20590.7 | 19747.7 | 18657.1 | 18493.0 | 18049.4 | 18470.9 | 12545.1 |
| 47.5° | 18223.4 | 18461.1 | 19127.7 | 20686.3 | 21715.6 | 21995.0 | 20914.2 | 20813.8 | 19568.8 | 19620.3 | 13013.2 |
| 50°   | 15738.4 | 15985.9 | 17213.7 | 19693.8 | 21999.9 | 23779.1 | 23391.9 | 23183.6 | 20838.3 | 20380.0 | 13238.7 |
| 52.5° | 13189.6 | 13415.1 | 14248.3 | 17331.3 | 20821.1 | 24340.3 | 25479.9 | 25232.4 | 21977.8 | 20644.7 | 13145.5 |
| 55°   | 9177.9  | 9479.3  | 10292.9 | 12954.4 | 18105.7 | 23247.3 | 26171.0 | 26119.5 | 22994.9 | 20478.0 | 13000.9 |
| 57.5° | 4499.5  | 4798.5  | 5609.6  | 7986.8  | 13412.7 | 20296.7 | 25114.7 | 25386.8 | 23602.7 | 20299.1 | 12883.3 |
| 60°   | 1879.7  | 2002.2  | 2281.6  | 3504.5  | 7504.0  | 15338.9 | 22730.2 | 23107.6 | 23230.1 | 20056.5 | 12871.1 |
| 62.5° | 1090.6  | 1110.2  | 1139.6  | 1453.3  | 2918.8  | 8793.1  | 18855.7 | 19392.4 | 21272.0 | 19735.5 | 12677.4 |
| 65°   | 823.4   | 830.8   | 818.5   | 892.1   | 1205.7  | 3335.4  | 13623.4 | 14353.7 | 17755.3 | 18480.7 | 11912.8 |
| 67.5° | 676.4   | 676.4   | 644.5   | 659.2   | 757.3   | 1249.9  | 7521.2  | 8540.7  | 13138.2 | 15189.4 | 9837.1  |
| 70°   | 539.2   | 551.4   | 536.7   | 517.1   | 541.6   | 691.1   | 2676.2  | 3318.2  | 7651.1  | 8969.5  | 5737.1  |
| 72.5° | 409.3   | 409.3   | 433.8   | 419.1   | 401.9   | 433.8   | 933.7   | 1048.9  | 3070.7  | 3739.8  | 2070.8  |
| 75°   | 316.1   | 325.9   | 343.1   | 328.4   | 303.9   | 257.3   | 448.5   | 475.4   | 926.4   | 870.0   | 463.2   |
| 77.5° | 161.7   | 164.2   | 218.1   | 240.2   | 225.5   | 156.8   | 196.1   | 215.7   | 301.4   | 269.6   | 171.5   |
| 80°   | 98.0    | 102.9   | 122.5   | 188.7   | 149.5   | 83.3    | 80.9    | 85.8    | 142.1   | 122.5   | 71.1    |
| 82.5° | 41.7    | 44.1    | 68.6    | 68.6    | 61.3    | 31.9    | 31.9    | 31.9    | 68.6    | 63.7    | 29.4    |
| 85°   | 0.0     | 0.0     | 12.3    | 9.8     | 9.8     | 12.3    | 12.3    | 12.3    | 17.2    | 24.5    | 14.7    |
| 87.5° | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 2.5     | 7.4     | 7.4     |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P640609

CATALOG NUMBER: GWS-SA5E-730-U-AFL-W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 7406.0 | 7406.0 | 7406.0 | 7406.0 | 7406.0 | 7406.0 | 7406.0 | 7406.0 | 7406.0 | 7406.0 | 7406.0 |
| 2.5°  | 7406.0 | 7249.2 | 7038.4 | 6847.2 | 6589.9 | 6445.3 | 6244.4 | 6080.2 | 5940.5 | 5896.4 | 5876.8 |
| 5°    | 7408.5 | 7138.9 | 6687.9 | 6237.0 | 5683.2 | 5246.9 | 4798.5 | 4443.1 | 4151.5 | 4058.4 | 4033.8 |
| 7.5°  | 7457.5 | 7060.5 | 6330.1 | 5511.6 | 4585.3 | 3820.6 | 3136.9 | 2524.2 | 2239.9 | 2144.4 | 2124.8 |
| 10°   | 7523.6 | 6994.3 | 5916.0 | 4641.6 | 3310.9 | 2328.2 | 1649.3 | 1257.2 | 1071.0 | 968.0  | 982.7  |
| 12.5° | 7609.4 | 6940.4 | 5457.7 | 3700.6 | 2190.9 | 1279.3 | 906.8  | 759.7  | 720.5  | 700.9  | 691.1  |
| 15°   | 7724.6 | 6876.7 | 4889.1 | 2766.8 | 1343.0 | 823.4  | 698.4  | 659.2  | 644.5  | 634.7  | 632.3  |
| 17.5° | 7842.2 | 6803.1 | 4310.8 | 1945.9 | 892.1  | 683.7  | 627.4  | 607.8  | 598.0  | 590.6  | 588.2  |
| 20°   | 7967.2 | 6678.1 | 3631.9 | 1340.5 | 703.3  | 615.1  | 578.4  | 556.3  | 544.1  | 531.8  | 529.4  |
| 22.5° | 8021.1 | 6477.2 | 2982.5 | 938.6  | 624.9  | 566.1  | 519.5  | 492.6  | 477.9  | 468.1  | 468.1  |
| 25°   | 7969.7 | 6151.2 | 2311.0 | 713.2  | 568.6  | 512.2  | 465.6  | 436.2  | 424.0  | 414.2  | 414.2  |
| 27.5° | 7832.4 | 5732.2 | 1686.1 | 590.6  | 507.3  | 455.8  | 411.7  | 384.8  | 375.0  | 370.1  | 370.1  |
| 30°   | 7680.5 | 5202.8 | 1188.6 | 507.3  | 438.7  | 397.0  | 360.3  | 343.1  | 340.6  | 335.7  | 335.7  |
| 32.5° | 7550.6 | 4707.8 | 818.5  | 446.0  | 387.2  | 345.5  | 321.0  | 313.7  | 316.1  | 311.2  | 313.7  |
| 35°   | 7479.5 | 4222.5 | 607.8  | 397.0  | 345.5  | 306.3  | 294.1  | 294.1  | 294.1  | 291.6  | 291.6  |
| 37.5° | 7508.9 | 3744.7 | 495.0  | 362.7  | 308.8  | 279.4  | 267.1  | 272.0  | 276.9  | 276.9  | 276.9  |
| 40°   | 7656.0 | 3320.7 | 438.7  | 330.8  | 276.9  | 254.9  | 245.1  | 252.4  | 259.8  | 264.7  | 264.7  |
| 42.5° | 7842.2 | 2977.6 | 397.0  | 303.9  | 254.9  | 230.4  | 225.5  | 232.8  | 240.2  | 245.1  | 245.1  |
| 45°   | 7959.9 | 2632.0 | 355.4  | 269.6  | 232.8  | 203.4  | 203.4  | 213.2  | 210.8  | 213.2  | 213.2  |
| 47.5° | 8013.8 | 2357.6 | 313.7  | 232.8  | 198.5  | 176.5  | 178.9  | 183.8  | 178.9  | 183.8  | 183.8  |
| 50°   | 7881.4 | 2080.6 | 276.9  | 193.6  | 164.2  | 154.4  | 159.3  | 156.8  | 156.8  | 166.6  | 166.6  |
| 52.5° | 7638.8 | 1874.8 | 245.1  | 164.2  | 139.7  | 137.2  | 142.1  | 132.3  | 134.8  | 134.8  | 132.3  |
| 55°   | 7459.9 | 1757.1 | 218.1  | 142.1  | 120.1  | 122.5  | 120.1  | 102.9  | 93.1   | 83.3   | 80.9   |
| 57.5° | 7371.7 | 1710.6 | 198.5  | 127.4  | 107.8  | 107.8  | 98.0   | 71.1   | 53.9   | 41.7   | 36.8   |
| 60°   | 7352.1 | 1654.2 | 178.9  | 110.3  | 95.6   | 90.7   | 71.1   | 41.7   | 27.0   | 19.6   | 17.2   |
| 62.5° | 7165.8 | 1517.0 | 161.7  | 88.2   | 83.3   | 73.5   | 44.1   | 24.5   | 14.7   | 9.8    | 7.4    |
| 65°   | 6555.6 | 1247.4 | 144.6  | 68.6   | 63.7   | 53.9   | 27.0   | 14.7   | 7.4    | 2.5    | 0.0    |
| 67.5° | 5215.1 | 884.7  | 127.4  | 51.5   | 44.1   | 34.3   | 17.2   | 9.8    | 2.5    | 0.0    | 0.0    |
| 70°   | 3007.0 | 477.9  | 105.4  | 36.8   | 29.4   | 22.1   | 12.3   | 4.9    | 0.0    | 0.0    | 0.0    |
| 72.5° | 1004.8 | 223.0  | 80.9   | 24.5   | 22.1   | 17.2   | 7.4    | 2.5    | 0.0    | 0.0    | 0.0    |
| 75°   | 220.6  | 132.3  | 53.9   | 17.2   | 14.7   | 12.3   | 4.9    | 0.0    | 0.0    | 0.0    | 0.0    |
| 77.5° | 83.3   | 93.1   | 27.0   | 12.3   | 9.8    | 7.4    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 31.9   | 61.3   | 12.3   | 7.4    | 7.4    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 17.2   | 24.5   | 7.4    | 4.9    | 4.9    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 9.8    | 12.3   | 4.9    | 2.5    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 4.9    | 2.5    | 2.5    | 2.5    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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



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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

**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            |

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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 3000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 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            |        |               |               |

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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            |        |               |               |

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**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            |        |               |               |

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**Summary**

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



**Color Vector Graphics**





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**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 |            |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)