

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: P437961

Luminaire Tested: **IST-SA1A-722-U-T2-HSS**

Issue Date: 12/10/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P437961  
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: IST-SA1A-722-U-T2-HSS  
Description: IMPACT ELITE LED TRAPEZOID LUMINAIRE  
(1) 70 CRI, 2200K, 350mA LIGHTSQUARE WITH 16 LEDS AND TYPE II OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

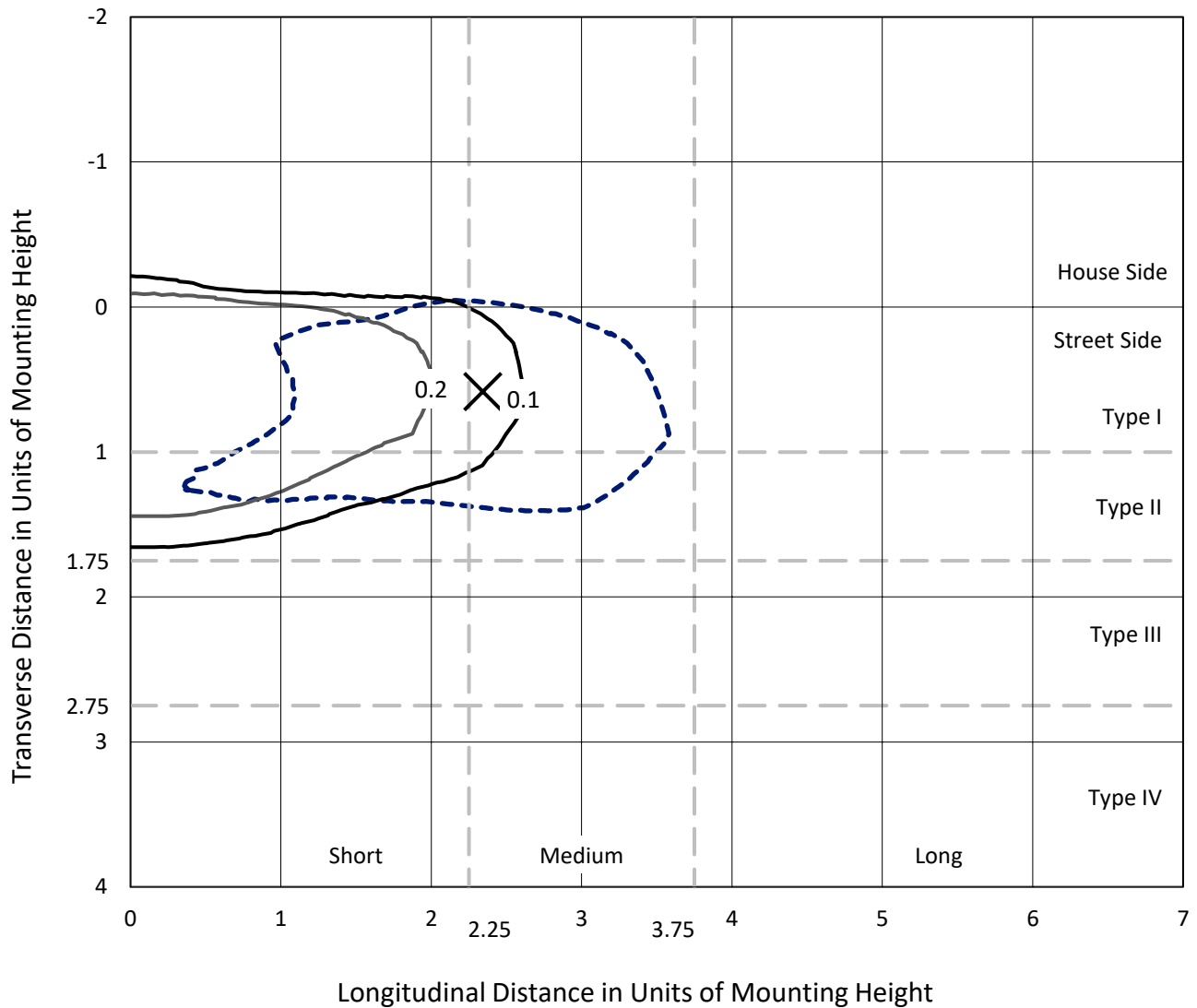
Lumens per Lamp: N/A  
Luminaire Lumens: 1503 lumens  
Efficiency: N/A  
Efficacy: 74.8 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B0 - U0 - G0  
  
Input Watts (W): 20.1  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

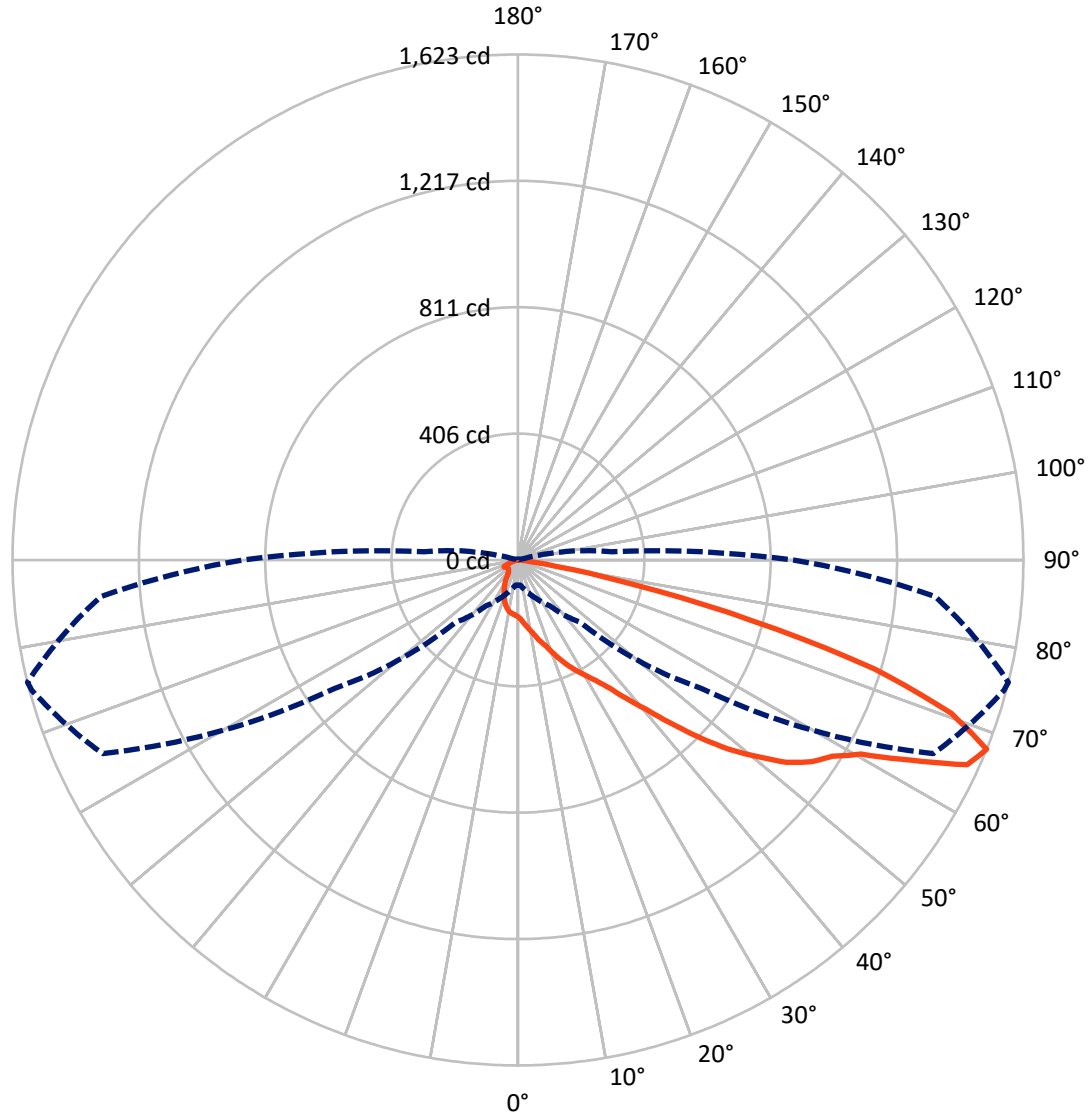
× Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.5 fc  
 Type II - Medium - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 76-Deg Lateral      - - - Horizontal Cone Through 67.5-Deg Vertical

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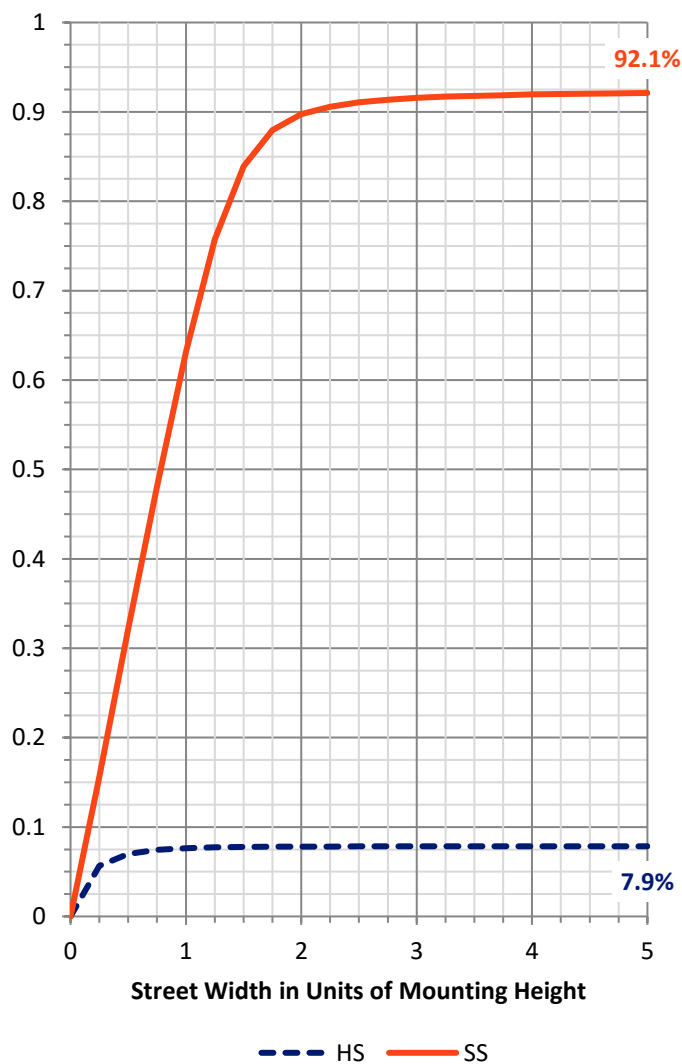
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 118.9    | 0.0    | 118.9  |
|                    | % Fixture | 7.9      | 0.0    | 7.9    |
| <b>Street Side</b> | Lumens    | 1384.1   | 0.0    | 1384.1 |
|                    | % Fixture | 92.1     | 0.0    | 92.1   |
| <b>Total</b>       | Lumens    | 1503.0   | 0.0    | 1503.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 17.5   | 1.2       |
| 10°-20°   | 48.8   | 3.2       |
| 20°-30°   | 84.3   | 5.6       |
| 30°-40°   | 150.1  | 10.0      |
| 40°-50°   | 267.4  | 17.8      |
| 50°-60°   | 400.9  | 26.7      |
| 60°-70°   | 379.7  | 25.3      |
| 70°-80°   | 148.0  | 9.8       |
| 80°-90°   | 6.1    | 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°    | 1503.0 | 100.0     |
| 0°-180°   | 1503.0 | 100.0     |

**Coefficient of Utilization**



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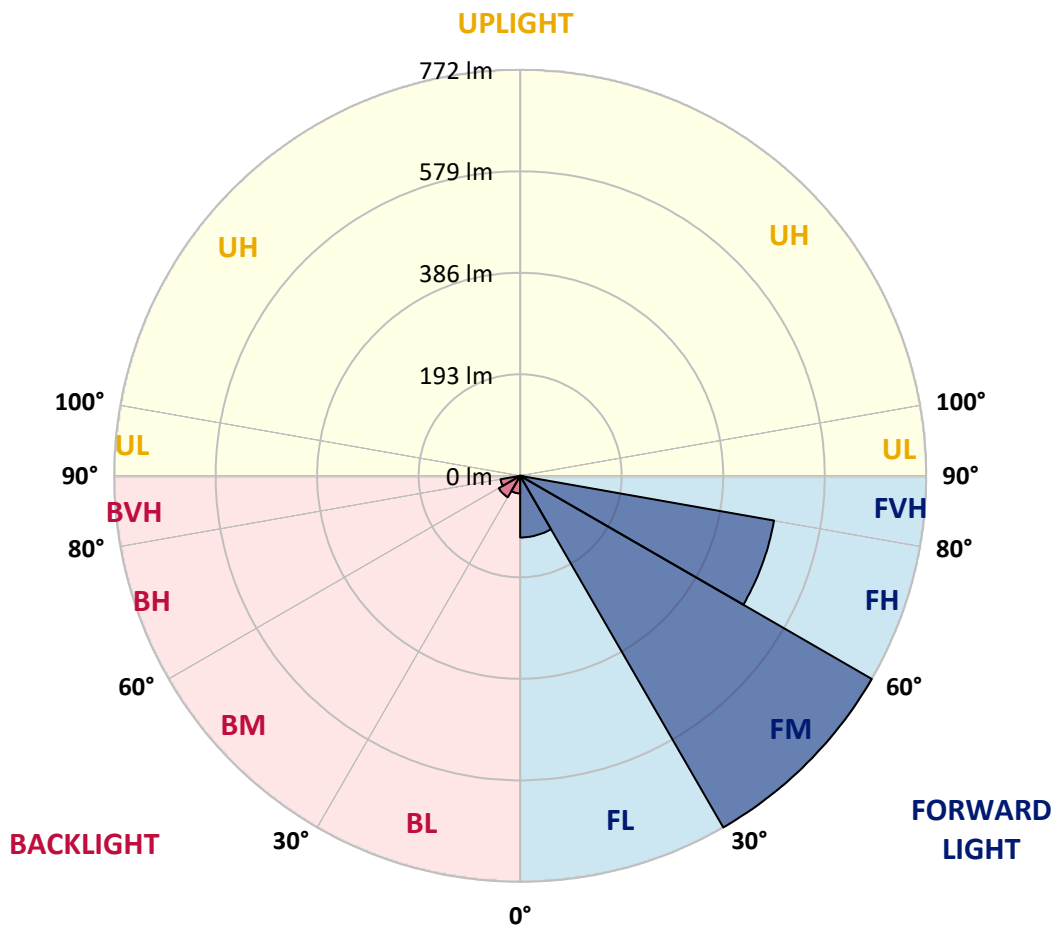
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|----------------|--------|-----------|-------------------------|------|--------|
|                |        |           | B                       | U    | G      |
| FL (0°-30°)    | 117.2  | 7.8       |                         |      |        |
| FM (30°-60°)   | 771.5  | 51.3      |                         |      |        |
| FH (60°-80°)   | 489.8  | 32.6      |                         |      | G0/660 |
| FVH (80°-90°)  | 5.6    | 0.4       |                         |      | G0/10  |
| BL (0°-30°)    | 33.5   | 2.2       | B0/110                  |      |        |
| BM (30°-60°)   | 46.9   | 3.1       | B0/220                  |      |        |
| BH (60°-80°)   | 38.0   | 2.5       | B0/110                  |      | G0/110 |
| BVH (80°-90°)  | 0.5    | 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-G0**

Type II Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| 0°    | 182.8 | 182.8 | 182.8 | 182.8 | 182.8 | 182.8 | 182.8  | 182.8  | 182.8  | 182.8  | 182.8  |
| 2.5°  | 216.5 | 214.4 | 213.0 | 212.3 | 210.9 | 206.7 | 203.2  | 196.8  | 191.2  | 191.2  | 187.7  |
| 5°    | 236.2 | 235.5 | 232.7 | 231.3 | 230.6 | 227.8 | 221.4  | 213.7  | 204.6  | 203.9  | 195.4  |
| 7.5°  | 241.8 | 242.5 | 242.5 | 243.9 | 244.6 | 243.2 | 237.6  | 230.6  | 218.6  | 217.2  | 204.6  |
| 10°   | 239.7 | 239.7 | 241.8 | 246.0 | 251.7 | 254.5 | 253.8  | 248.2  | 234.1  | 232.7  | 215.1  |
| 12.5° | 232.0 | 233.4 | 236.9 | 243.9 | 254.5 | 262.9 | 267.8  | 265.7  | 251.7  | 250.3  | 229.2  |
| 15°   | 221.4 | 222.8 | 229.2 | 239.0 | 253.1 | 269.2 | 280.5  | 286.8  | 272.8  | 271.4  | 243.9  |
| 17.5° | 206.7 | 208.1 | 215.1 | 229.9 | 249.6 | 272.1 | 293.9  | 306.5  | 294.6  | 290.3  | 259.4  |
| 20°   | 201.1 | 202.5 | 208.1 | 220.0 | 243.2 | 272.1 | 305.8  | 329.7  | 320.6  | 317.1  | 279.1  |
| 22.5° | 223.6 | 222.8 | 217.9 | 219.3 | 236.9 | 270.0 | 314.9  | 358.5  | 351.5  | 346.6  | 300.2  |
| 25°   | 264.3 | 267.1 | 260.1 | 243.9 | 241.1 | 267.8 | 321.3  | 381.0  | 380.3  | 375.4  | 322.0  |
| 27.5° | 311.4 | 312.8 | 305.1 | 288.2 | 265.0 | 272.1 | 328.3  | 403.5  | 407.0  | 402.8  | 338.8  |
| 30°   | 350.1 | 355.0 | 349.4 | 333.9 | 309.3 | 290.3 | 333.2  | 423.9  | 435.9  | 430.2  | 355.0  |
| 32.5° | 405.6 | 407.7 | 402.1 | 379.6 | 354.3 | 325.5 | 342.4  | 441.5  | 467.5  | 462.6  | 374.0  |
| 35°   | 464.0 | 466.8 | 456.2 | 431.6 | 400.7 | 368.4 | 364.2  | 465.4  | 513.2  | 503.3  | 402.8  |
| 37.5° | 516.0 | 518.8 | 513.9 | 483.7 | 453.4 | 419.0 | 402.8  | 497.7  | 568.7  | 562.4  | 438.7  |
| 40°   | 557.5 | 564.5 | 563.1 | 537.1 | 509.0 | 478.0 | 458.4  | 535.7  | 632.7  | 627.1  | 484.4  |
| 42.5° | 599.7 | 604.6 | 601.8 | 582.8 | 563.1 | 544.1 | 519.5  | 588.4  | 714.9  | 712.1  | 541.3  |
| 45°   | 652.4 | 660.1 | 656.6 | 641.1 | 617.2 | 613.0 | 589.8  | 651.7  | 812.7  | 808.4  | 610.2  |
| 47.5° | 730.4 | 737.4 | 731.8 | 710.7 | 683.3 | 675.6 | 655.9  | 723.4  | 908.3  | 906.2  | 678.4  |
| 50°   | 772.6 | 779.6 | 794.4 | 797.9 | 779.6 | 738.1 | 714.9  | 791.6  | 994.0  | 990.5  | 743.8  |
| 52.5° | 757.8 | 764.2 | 800.0 | 833.8 | 873.8 | 838.7 | 786.7  | 865.4  | 1072.8 | 1079.1 | 807.7  |
| 55°   | 694.6 | 703.0 | 754.3 | 808.4 | 905.5 | 952.6 | 892.8  | 949.0  | 1134.6 | 1143.8 | 849.9  |
| 57.5° | 566.6 | 576.5 | 642.5 | 726.2 | 857.0 | 981.4 | 1024.3 | 1064.3 | 1176.8 | 1188.8 | 904.1  |
| 60°   | 339.5 | 355.0 | 423.2 | 534.3 | 715.7 | 913.2 | 1117.8 | 1230.2 | 1259.1 | 1264.7 | 1019.3 |
| 62.5° | 188.4 | 184.9 | 239.7 | 331.1 | 493.5 | 741.7 | 1103.7 | 1432.0 | 1414.4 | 1414.4 | 1216.2 |
| 65°   | 113.2 | 116.7 | 144.8 | 196.8 | 286.8 | 489.3 | 984.2  | 1556.4 | 1579.6 | 1584.6 | 1375.8 |
| 67.5° | 80.1  | 80.8  | 101.2 | 135.0 | 179.3 | 281.9 | 717.8  | 1470.7 | 1615.5 | 1622.5 | 1344.1 |
| 70°   | 52.0  | 52.7  | 72.4  | 96.3  | 127.9 | 155.4 | 438.7  | 1212.0 | 1479.8 | 1476.3 | 1188.8 |
| 72.5° | 31.6  | 33.0  | 45.7  | 71.0  | 98.4  | 87.9  | 236.2  | 875.9  | 1172.6 | 1196.5 | 932.9  |
| 75°   | 19.7  | 21.1  | 27.4  | 49.2  | 68.9  | 59.8  | 104.0  | 584.9  | 756.4  | 774.7  | 602.5  |
| 77.5° | 11.2  | 12.7  | 17.6  | 28.1  | 49.2  | 41.5  | 49.2   | 307.2  | 366.3  | 378.2  | 241.8  |
| 80°   | 4.2   | 4.9   | 9.1   | 14.1  | 30.2  | 25.3  | 22.5   | 104.0  | 116.7  | 130.8  | 73.8   |
| 82.5° | 0.7   | 1.4   | 4.2   | 8.4   | 12.0  | 12.0  | 9.8    | 31.6   | 32.3   | 34.4   | 19.7   |
| 85°   | 0.0   | 0.0   | 1.4   | 2.1   | 2.1   | 2.1   | 3.5    | 6.3    | 9.8    | 9.8    | 5.6    |
| 87.5° | 0.0   | 0.0   | 0.0   | 0.0   | 0.7   | 0.7   | 0.7    | 1.4    | 1.4    | 1.4    | 1.4    |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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 CATALOG NUMBER: IST-SA1A-722-U-T2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 182.8 | 182.8 | 182.8 | 182.8 | 182.8 | 182.8 | 182.8 | 182.8 | 182.8 | 182.8 | 182.8 |
| 2.5°  | 184.2 | 182.8 | 177.2 | 171.5 | 167.3 | 163.8 | 158.2 | 158.2 | 156.1 | 154.0 | 154.7 |
| 5°    | 189.1 | 184.9 | 174.3 | 163.8 | 154.0 | 144.8 | 137.1 | 133.6 | 128.6 | 127.2 | 126.5 |
| 7.5°  | 195.4 | 187.7 | 170.1 | 153.3 | 137.1 | 125.1 | 115.3 | 109.0 | 103.3 | 101.9 | 102.6 |
| 10°   | 203.2 | 191.9 | 165.2 | 139.2 | 119.5 | 104.7 | 93.5  | 88.6  | 82.3  | 80.1  | 78.0  |
| 12.5° | 214.4 | 196.8 | 157.5 | 123.7 | 101.9 | 87.2  | 71.0  | 59.1  | 54.8  | 53.4  | 53.4  |
| 15°   | 223.6 | 199.7 | 147.6 | 109.0 | 87.2  | 64.0  | 50.6  | 48.5  | 47.8  | 47.8  | 47.8  |
| 17.5° | 234.1 | 201.8 | 135.7 | 94.9  | 67.5  | 47.1  | 44.3  | 44.3  | 43.6  | 43.6  | 42.9  |
| 20°   | 245.3 | 202.5 | 123.0 | 82.3  | 47.8  | 42.2  | 40.1  | 39.4  | 38.0  | 37.3  | 37.3  |
| 22.5° | 258.0 | 201.8 | 109.0 | 67.5  | 42.2  | 38.7  | 35.1  | 33.7  | 32.3  | 30.9  | 30.9  |
| 25°   | 268.5 | 200.4 | 96.3  | 48.5  | 38.7  | 33.7  | 30.2  | 28.1  | 26.7  | 26.0  | 25.3  |
| 27.5° | 277.7 | 192.6 | 83.7  | 41.5  | 35.1  | 30.2  | 26.0  | 23.9  | 22.5  | 21.8  | 21.8  |
| 30°   | 278.4 | 180.0 | 73.1  | 38.7  | 32.3  | 26.7  | 22.5  | 21.1  | 20.4  | 19.7  | 19.7  |
| 32.5° | 282.6 | 167.3 | 61.9  | 36.6  | 28.8  | 23.9  | 20.4  | 19.0  | 17.6  | 17.6  | 17.6  |
| 35°   | 291.0 | 156.1 | 47.8  | 33.0  | 26.0  | 21.1  | 18.3  | 16.9  | 16.2  | 15.5  | 15.5  |
| 37.5° | 304.4 | 148.3 | 39.4  | 30.2  | 23.9  | 19.0  | 16.9  | 15.5  | 14.8  | 14.1  | 14.1  |
| 40°   | 322.0 | 144.1 | 35.9  | 27.4  | 21.1  | 17.6  | 15.5  | 14.1  | 12.7  | 12.0  | 12.0  |
| 42.5° | 352.2 | 144.1 | 33.0  | 24.6  | 19.0  | 16.2  | 14.1  | 12.7  | 11.2  | 10.5  | 10.5  |
| 45°   | 387.4 | 149.7 | 30.9  | 21.8  | 16.9  | 14.8  | 12.7  | 10.5  | 9.1   | 8.4   | 8.4   |
| 47.5° | 426.0 | 160.3 | 28.8  | 19.7  | 15.5  | 13.4  | 11.2  | 8.4   | 7.0   | 6.3   | 6.3   |
| 50°   | 471.0 | 175.7 | 27.4  | 17.6  | 14.1  | 12.0  | 9.1   | 6.3   | 5.6   | 4.9   | 4.9   |
| 52.5° | 509.0 | 191.2 | 25.3  | 16.2  | 12.7  | 10.5  | 7.0   | 5.6   | 4.2   | 4.2   | 4.2   |
| 55°   | 544.8 | 208.1 | 23.9  | 14.8  | 12.0  | 8.4   | 5.6   | 4.2   | 3.5   | 3.5   | 3.5   |
| 57.5° | 592.6 | 229.2 | 21.8  | 13.4  | 9.8   | 6.3   | 4.9   | 3.5   | 2.8   | 2.8   | 2.8   |
| 60°   | 690.3 | 276.3 | 19.0  | 12.0  | 8.4   | 5.6   | 4.2   | 3.5   | 2.8   | 2.1   | 2.1   |
| 62.5° | 849.2 | 352.9 | 16.2  | 10.5  | 6.3   | 4.9   | 3.5   | 2.8   | 2.1   | 1.4   | 1.4   |
| 65°   | 949.7 | 371.9 | 13.4  | 8.4   | 4.9   | 3.5   | 2.8   | 2.1   | 1.4   | 0.7   | 0.7   |
| 67.5° | 885.1 | 302.3 | 10.5  | 6.3   | 4.2   | 2.8   | 2.1   | 1.4   | 0.7   | 0.0   | 0.0   |
| 70°   | 747.3 | 228.5 | 7.7   | 4.2   | 3.5   | 2.1   | 1.4   | 0.7   | 0.0   | 0.0   | 0.0   |
| 72.5° | 590.5 | 173.6 | 7.0   | 3.5   | 2.8   | 1.4   | 1.4   | 0.7   | 0.0   | 0.0   | 0.0   |
| 75°   | 387.4 | 89.3  | 5.6   | 3.5   | 2.1   | 1.4   | 0.7   | 0.7   | 0.0   | 0.0   | 0.0   |
| 77.5° | 152.6 | 33.7  | 4.2   | 2.8   | 2.1   | 1.4   | 0.7   | 0.7   | 0.0   | 0.0   | 0.0   |
| 80°   | 41.5  | 11.2  | 2.1   | 1.4   | 1.4   | 0.7   | 0.7   | 0.7   | 0.0   | 0.0   | 0.0   |
| 82.5° | 10.5  | 4.9   | 1.4   | 1.4   | 0.7   | 0.7   | 0.7   | 0.7   | 0.0   | 0.0   | 0.0   |
| 85°   | 3.5   | 1.4   | 1.4   | 0.7   | 0.7   | 0.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 1.4   | 1.4   | 1.4   | 0.7   | 0.7   | 0.7   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



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



**Test Information**

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

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

**Spectral Parameters**

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

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

Rf: 69.8  
 Rg: 99.2



**Test Conditions**

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

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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 2200K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

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

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Scotopic Flux vs. Wavelength



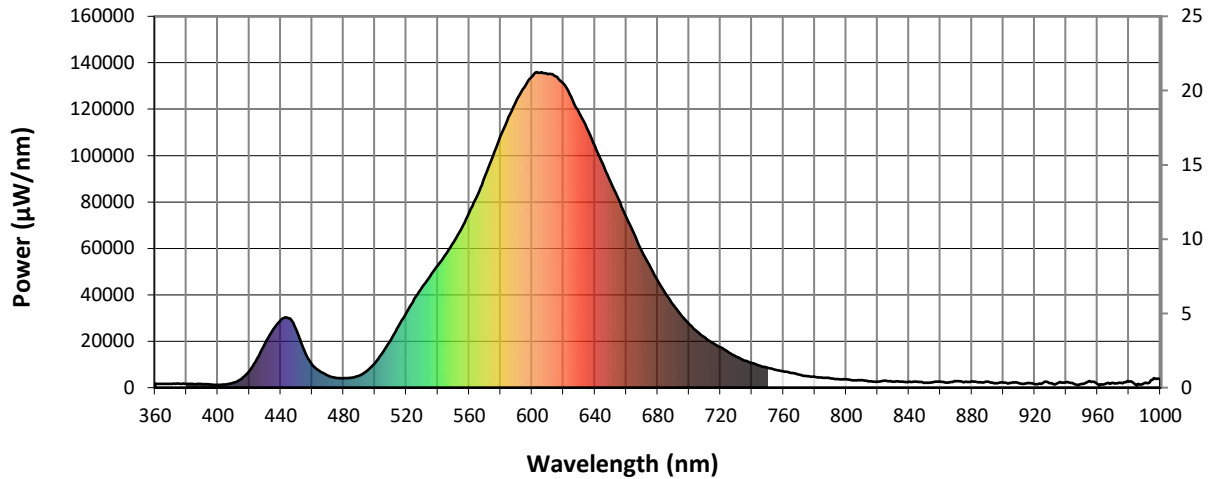
Scotopic Lumens: 4696.9

S/P: 0.85

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

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**Melanopic Flux vs. Wavelength**



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

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

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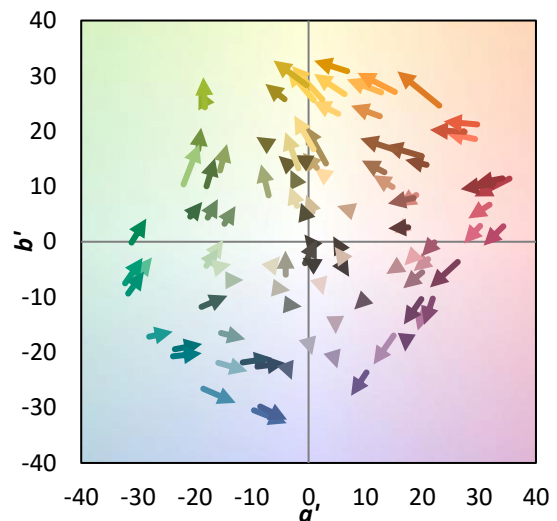
TM-30-18

**Summary**

$R_f = 69.8$   
 $R_g = 99.2$   
 $CIE R_a = 72.0$   
 $R_9 = -17.4$



**Color Vector Graphics**





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

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



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)