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: P639069

Luminaire Tested: GWS-SA5B-727-U-AFL-W-HSS

Issue Date: 1/10/2023

Report Generated By 670246102 / DESKTOP-G35701P

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | P639069 |
| | 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-SA5B-727-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) 2700K CCT, 70 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 12452.4 lumens |
| Efficiency: | N/A |
| Efficacy: | 107.6 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 1' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 115.7 |
| 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 |

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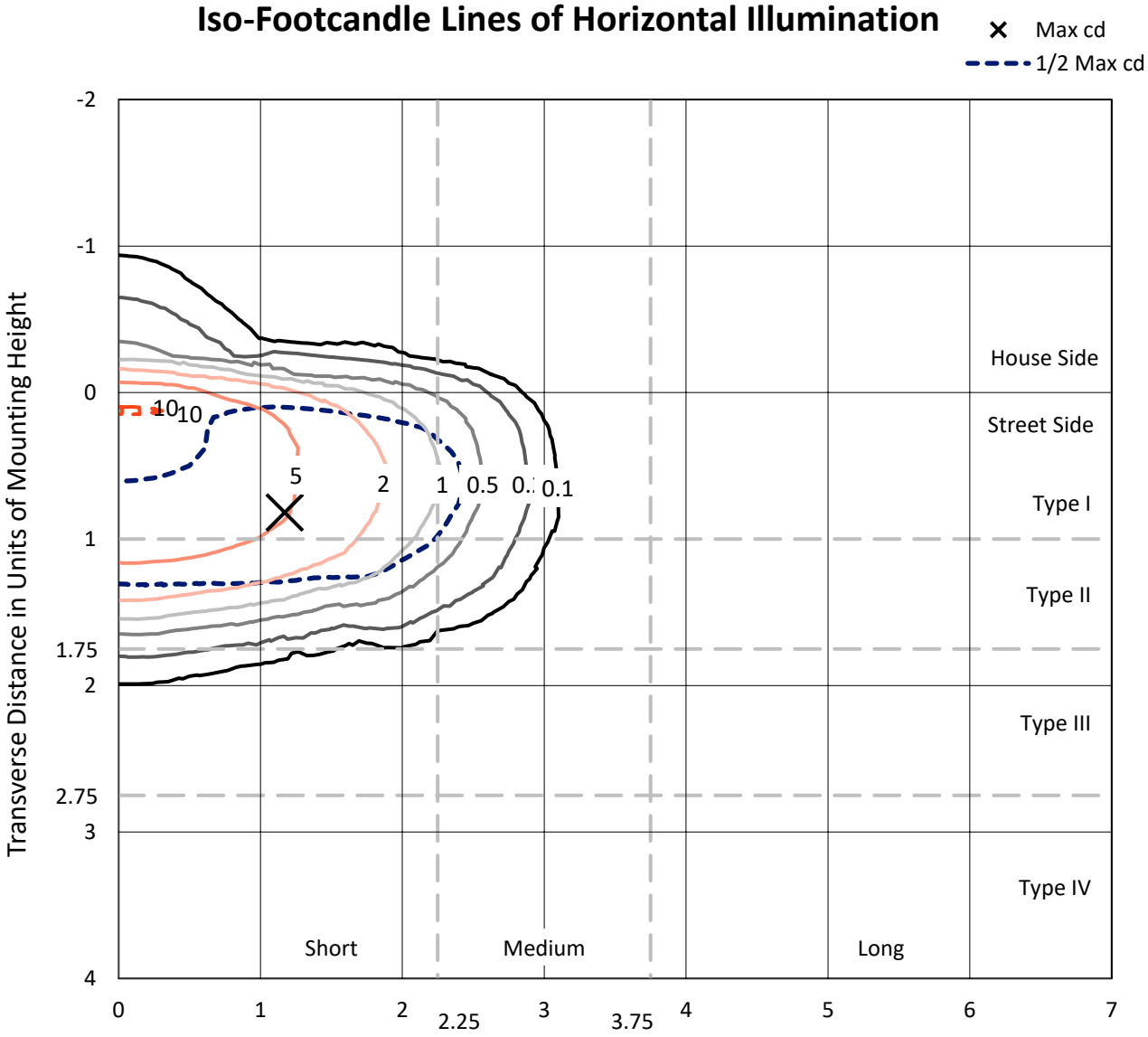
Scaled Data Report

REPORT NUMBER: P639069
CATALOG NUMBER: GWS-SA5B-727-U-AFL-W-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 10.5 fc
Type II - Short - N/A

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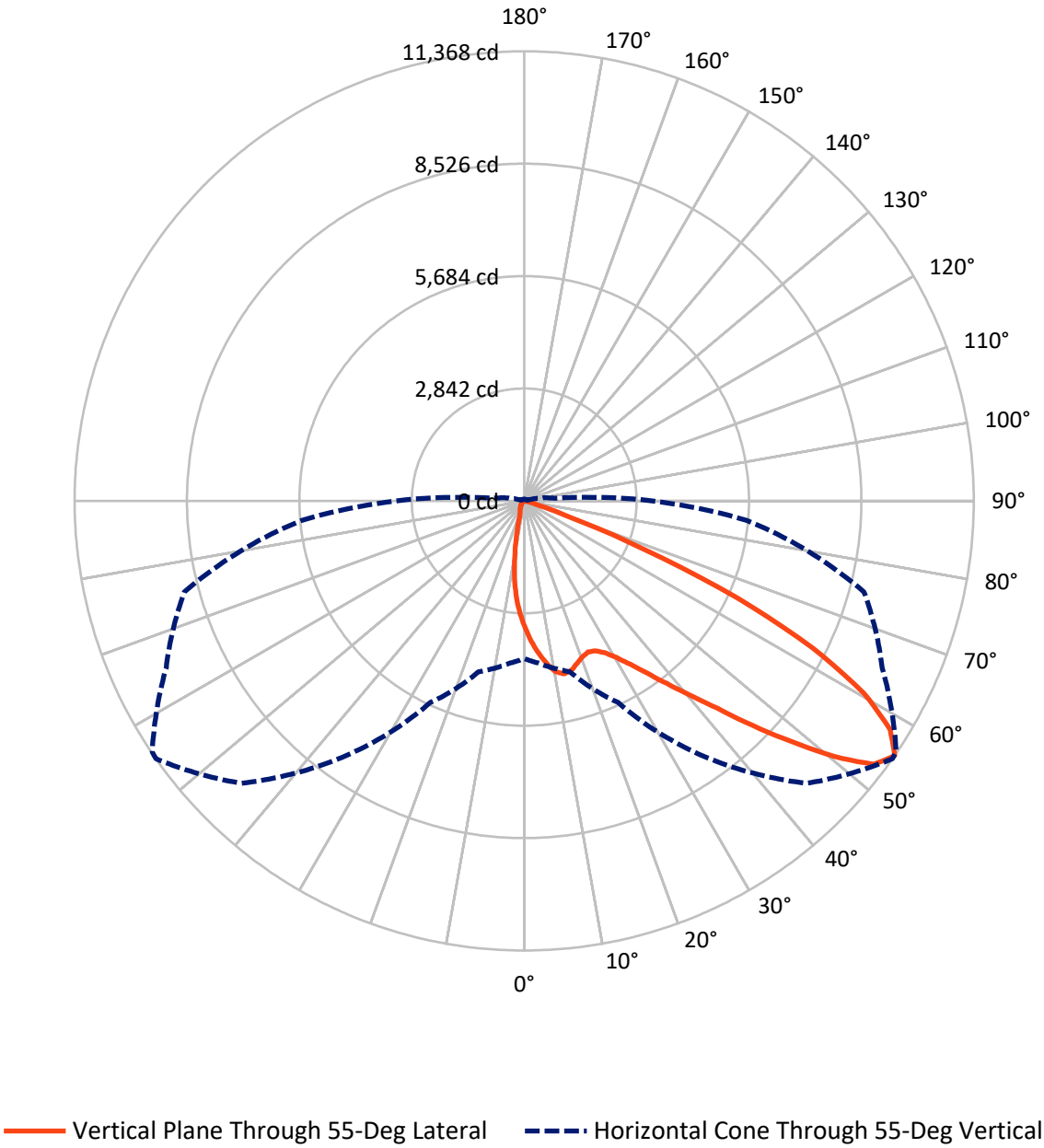
## Luminous Intensity Polar Plot



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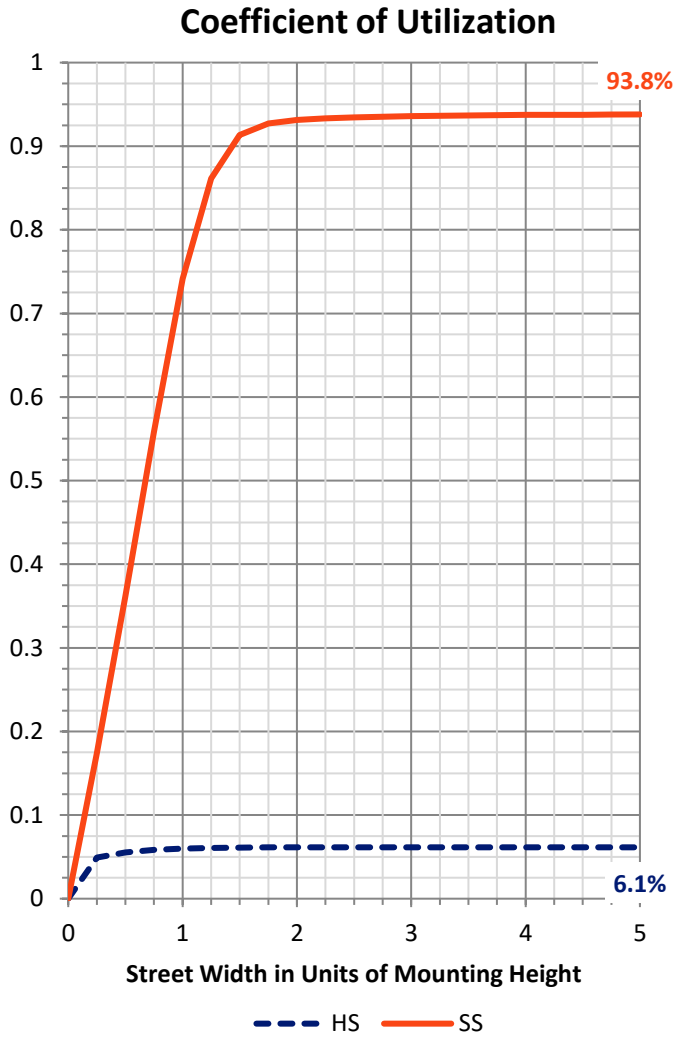
REPORT NUMBER: P639069
CATALOG NUMBER: GWS-SA5B-727-U-AFL-W-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 768.4 | 0.0 | 768.4 |
| | % Fixture | 6.2 | 0.0 | 6.2 |
| **Street Side** | Lumens | 11684.0 | 0.0 | 11684.0 |
| | % Fixture | 93.8 | 0.0 | 93.8 |
| **Total** | Lumens | 12452.4 | 0.0 | 12452.4 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 284.3 | 2.3 |
| 10°-20° | 685.4 | 5.5 |
| 20°-30° | 1141.5 | 9.2 |
| 30°-40° | 1945.2 | 15.6 |
| 40°-50° | 3175.2 | 25.5 |
| 50°-60° | 3324.3 | 26.7 |
| 60°-70° | 1676.7 | 13.5 |
| 70°-80° | 211.8 | 1.7 |
| 80°-90° | 8.0 | 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° | 12452.4 | 100.0 |
| 0°-180° | 12452.4 | 100.0 |



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REPORT NUMBER: P639069
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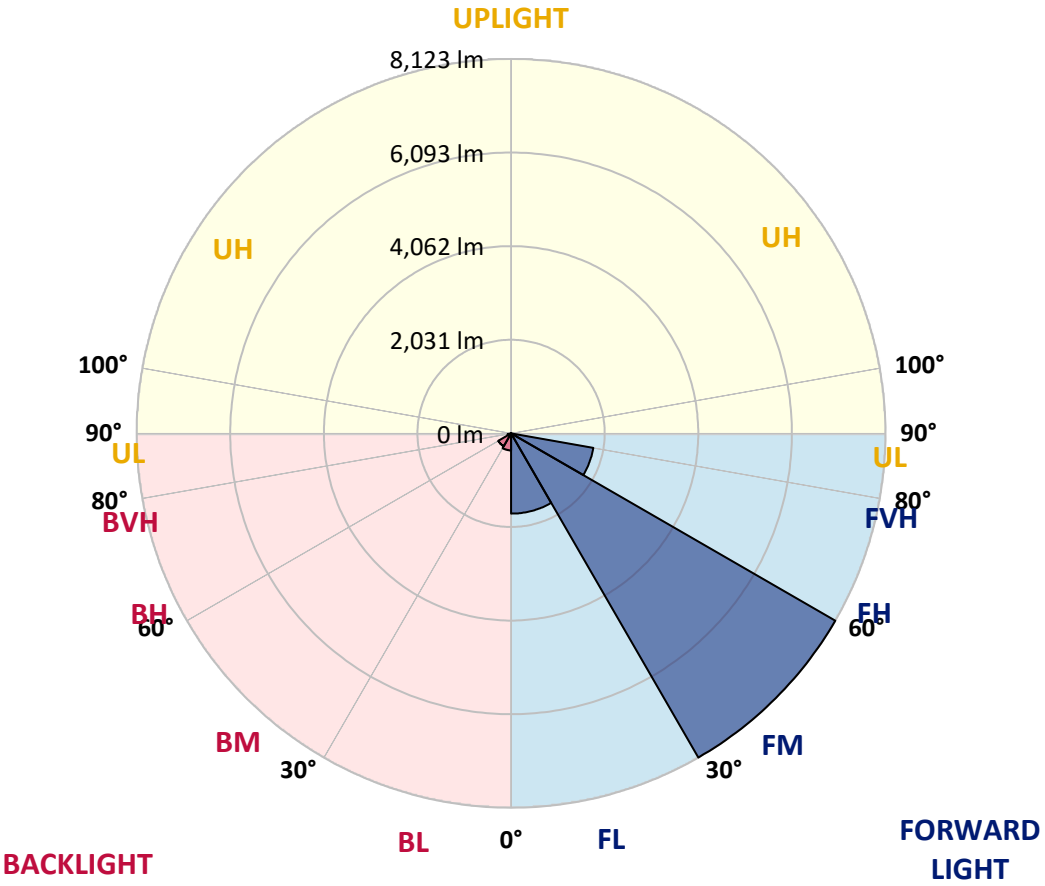
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1741.9 | 14.0 | | | |
| FM | (30°-60°) | 8123.4 | 65.2 | | | |
| FH | (60°-80°) | 1811.4 | 14.5 | | | G2/5000 |
| FVH | (80°-90°) | 7.3 | 0.1 | | | G0/10 |
| BL | (0°-30°) | 369.3 | 3.0 | B1/500 | | |
| BM | (30°-60°) | 321.3 | 2.6 | B1/1000 | | |
| BH | (60°-80°) | 77.1 | 0.6 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 0.7 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G2**
Type II Short



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Scaled Data Report

REPORT NUMBER: P639069
CATALOG NUMBER: GWS-SA5B-727-U-AFL-W-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 56° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 |
| 2.5° | 3750.3 | 3732.2 | 3759.9 | 3727.9 | 3673.6 | 3627.9 | 3568.3 | 3547.0 | 3451.2 | 3360.7 | 3273.4 |
| 5° | 4205.9 | 4211.2 | 4202.7 | 4158.0 | 4081.4 | 3996.2 | 3875.9 | 3849.3 | 3682.2 | 3509.7 | 3323.4 |
| 7.5° | 4318.7 | 4315.6 | 4333.6 | 4350.7 | 4337.9 | 4295.3 | 4164.4 | 4137.8 | 3930.2 | 3671.5 | 3400.1 |
| 10° | 3970.6 | 3972.8 | 4010.0 | 4125.0 | 4267.6 | 4415.6 | 4395.4 | 4380.5 | 4177.2 | 3854.6 | 3485.2 |
| 12.5° | 3478.8 | 3498.0 | 3537.4 | 3701.3 | 3943.0 | 4279.4 | 4488.0 | 4502.9 | 4403.9 | 4055.8 | 3585.3 |
| 15° | 3265.9 | 3270.2 | 3302.1 | 3401.1 | 3581.0 | 3996.2 | 4448.6 | 4490.1 | 4593.4 | 4258.1 | 3693.9 |
| 17.5° | 3260.6 | 3265.9 | 3279.8 | 3323.4 | 3440.5 | 3773.7 | 4321.9 | 4394.3 | 4736.0 | 4475.2 | 3823.7 |
| 20° | 3460.7 | 3457.6 | 3448.0 | 3424.6 | 3475.6 | 3700.3 | 4204.8 | 4284.7 | 4813.7 | 4687.1 | 3954.7 |
| 22.5° | 3823.7 | 3819.5 | 3776.9 | 3680.0 | 3638.5 | 3767.3 | 4147.4 | 4219.7 | 4860.6 | 4875.5 | 4062.2 |
| 25° | 4242.1 | 4271.9 | 4192.1 | 4045.2 | 3943.0 | 3938.7 | 4198.5 | 4249.6 | 4901.0 | 5042.6 | 4135.6 |
| 27.5° | 4700.9 | 4710.5 | 4642.4 | 4477.4 | 4329.4 | 4213.4 | 4346.4 | 4384.7 | 4945.7 | 5191.7 | 4177.2 |
| 30° | 5204.4 | 5201.2 | 5123.5 | 4931.9 | 4752.0 | 4584.9 | 4595.5 | 4610.4 | 5050.1 | 5362.0 | 4222.9 |
| 32.5° | 5833.6 | 5847.4 | 5709.0 | 5448.2 | 5232.1 | 5001.1 | 4921.3 | 4923.4 | 5238.5 | 5581.3 | 4292.1 |
| 35° | 6688.4 | 6654.3 | 6471.2 | 6099.7 | 5731.4 | 5482.3 | 5346.0 | 5334.3 | 5529.1 | 5876.1 | 4412.4 |
| 37.5° | 7502.7 | 7505.9 | 7314.3 | 6905.5 | 6440.3 | 6047.5 | 5854.8 | 5822.9 | 5937.9 | 6284.9 | 4612.6 |
| 40° | 8068.0 | 8078.6 | 7998.8 | 7784.8 | 7291.9 | 6736.3 | 6453.1 | 6420.1 | 6468.0 | 6802.3 | 4874.4 |
| 42.5° | 8367.1 | 8396.9 | 8419.3 | 8469.3 | 8095.7 | 7596.4 | 7161.0 | 7157.8 | 7107.8 | 7392.0 | 5177.8 |
| 45° | 8378.8 | 8423.5 | 8559.8 | 8901.5 | 8944.1 | 8577.9 | 8104.2 | 8032.8 | 7840.2 | 8023.3 | 5449.3 |
| 47.5° | 7915.7 | 8019.0 | 8308.6 | 8985.6 | 9432.7 | 9554.0 | 9084.6 | 9040.9 | 8500.2 | 8522.5 | 5652.6 |
| 50° | 6836.3 | 6943.8 | 7477.2 | 8554.5 | 9556.2 | 10329.0 | 10160.8 | 10070.3 | 9051.6 | 8852.5 | 5750.5 |
| 52.5° | 5729.2 | 5827.2 | 6189.1 | 7528.3 | 9044.1 | 10572.8 | 11067.8 | 10960.3 | 9546.6 | 8967.5 | 5710.1 |
| 55° | 3986.6 | 4117.6 | 4471.0 | 5627.0 | 7864.7 | 10098.0 | 11368.0 | 11345.6 | 9988.4 | 8895.1 | 5647.3 |
| 57.5° | 1954.5 | 2084.3 | 2436.7 | 3469.3 | 5826.1 | 8816.3 | 10909.2 | 11027.3 | 10252.4 | 8817.4 | 5596.2 |
| 60° | 816.5 | 869.7 | 991.1 | 1522.3 | 3259.6 | 6662.8 | 9873.4 | 10037.3 | 10090.6 | 8712.0 | 5590.8 |
| 62.5° | 473.7 | 482.2 | 495.0 | 631.3 | 1267.8 | 3819.5 | 8190.4 | 8423.5 | 9240.0 | 8572.6 | 5506.7 |
| 65° | 357.7 | 360.9 | 355.5 | 387.5 | 523.7 | 1448.8 | 5917.7 | 6234.9 | 7712.4 | 8027.5 | 5174.6 |
| 67.5° | 293.8 | 293.8 | 280.0 | 286.4 | 328.9 | 542.9 | 3267.0 | 3709.8 | 5706.9 | 6597.9 | 4273.0 |
| 70° | 234.2 | 239.5 | 233.1 | 224.6 | 235.3 | 300.2 | 1162.5 | 1441.4 | 3323.4 | 3896.1 | 2492.0 |
| 72.5° | 177.8 | 177.8 | 188.4 | 182.0 | 174.6 | 188.4 | 405.6 | 455.6 | 1333.8 | 1624.5 | 899.5 |
| 75° | 137.3 | 141.6 | 149.0 | 142.6 | 132.0 | 111.8 | 194.8 | 206.5 | 402.4 | 377.9 | 201.2 |
| 77.5° | 70.3 | 71.3 | 94.7 | 104.3 | 97.9 | 68.1 | 85.2 | 93.7 | 130.9 | 117.1 | 74.5 |
| 80° | 42.6 | 44.7 | 53.2 | 82.0 | 64.9 | 36.2 | 35.1 | 37.3 | 61.7 | 53.2 | 30.9 |
| 82.5° | 18.1 | 19.2 | 29.8 | 29.8 | 26.6 | 13.8 | 13.8 | 13.8 | 29.8 | 27.7 | 12.8 |
| 85° | 0.0 | 0.0 | 5.3 | 4.3 | 4.3 | 5.3 | 5.3 | 5.3 | 7.5 | 10.6 | 6.4 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 3.2 | 3.2 |
| 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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Scaled Data Report

REPORT NUMBER: P639069
CATALOG NUMBER: GWS-SA5B-727-U-AFL-W-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 | 3217.0 |
| 2.5° | 3217.0 | 3148.8 | 3057.3 | 2974.3 | 2862.5 | 2799.7 | 2712.4 | 2641.1 | 2580.4 | 2561.2 | 2552.7 |
| 5° | 3218.0 | 3100.9 | 2905.1 | 2709.2 | 2468.6 | 2279.1 | 2084.3 | 1930.0 | 1803.3 | 1762.8 | 1752.2 |
| 7.5° | 3239.3 | 3066.9 | 2749.6 | 2394.1 | 1991.7 | 1659.6 | 1362.6 | 1096.5 | 973.0 | 931.5 | 922.9 |
| 10° | 3268.1 | 3038.1 | 2569.7 | 2016.2 | 1438.2 | 1011.3 | 716.4 | 546.1 | 465.2 | 420.5 | 426.9 |
| 12.5° | 3305.3 | 3014.7 | 2370.7 | 1607.4 | 951.7 | 555.7 | 393.9 | 330.0 | 313.0 | 304.5 | 300.2 |
| 15° | 3355.4 | 2987.0 | 2123.7 | 1201.8 | 583.4 | 357.7 | 303.4 | 286.4 | 280.0 | 275.7 | 274.6 |
| 17.5° | 3406.5 | 2955.1 | 1872.5 | 845.2 | 387.5 | 297.0 | 272.5 | 264.0 | 259.7 | 256.5 | 255.5 |
| 20° | 3460.7 | 2900.8 | 1577.6 | 582.3 | 305.5 | 267.2 | 251.2 | 241.6 | 236.3 | 231.0 | 229.9 |
| 22.5° | 3484.2 | 2813.5 | 1295.5 | 407.7 | 271.5 | 245.9 | 225.7 | 214.0 | 207.6 | 203.3 | 203.3 |
| 25° | 3461.8 | 2671.9 | 1003.8 | 309.8 | 247.0 | 222.5 | 202.3 | 189.5 | 184.2 | 179.9 | 179.9 |
| 27.5° | 3402.2 | 2489.9 | 732.4 | 256.5 | 220.4 | 198.0 | 178.8 | 167.1 | 162.9 | 160.7 | 160.7 |
| 30° | 3336.2 | 2260.0 | 516.3 | 220.4 | 190.5 | 172.5 | 156.5 | 149.0 | 148.0 | 145.8 | 145.8 |
| 32.5° | 3279.8 | 2044.9 | 355.5 | 193.7 | 168.2 | 150.1 | 139.5 | 136.3 | 137.3 | 135.2 | 136.3 |
| 35° | 3248.9 | 1834.2 | 264.0 | 172.5 | 150.1 | 133.1 | 127.7 | 127.7 | 127.7 | 126.7 | 126.7 |
| 37.5° | 3261.7 | 1626.6 | 215.0 | 157.5 | 134.1 | 121.4 | 116.0 | 118.2 | 120.3 | 120.3 | 120.3 |
| 40° | 3325.6 | 1442.4 | 190.5 | 143.7 | 120.3 | 110.7 | 106.5 | 109.6 | 112.8 | 115.0 | 115.0 |
| 42.5° | 3406.5 | 1293.4 | 172.5 | 132.0 | 110.7 | 100.1 | 97.9 | 101.1 | 104.3 | 106.5 | 106.5 |
| 45° | 3457.6 | 1143.3 | 154.4 | 117.1 | 101.1 | 88.4 | 88.4 | 92.6 | 91.5 | 92.6 | 92.6 |
| 47.5° | 3481.0 | 1024.1 | 136.3 | 101.1 | 86.2 | 76.6 | 77.7 | 79.8 | 77.7 | 79.8 | 79.8 |
| 50° | 3423.5 | 903.8 | 120.3 | 84.1 | 71.3 | 67.1 | 69.2 | 68.1 | 68.1 | 72.4 | 72.4 |
| 52.5° | 3318.1 | 814.4 | 106.5 | 71.3 | 60.7 | 59.6 | 61.7 | 57.5 | 58.5 | 58.5 | 57.5 |
| 55° | *3240.4* | *763.3* | *94.7* | *61.7* | *52.2* | *53.2* | *52.2* | *44.7* | *40.5* | *36.2* | *35.1* |
| 57.5° | 3202.1 | 743.0 | 86.2 | 55.4 | 46.8 | 46.8 | 42.6 | 30.9 | 23.4 | 18.1 | 16.0 |
| 60° | 3193.6 | 718.5 | 77.7 | 47.9 | 41.5 | 39.4 | 30.9 | 18.1 | 11.7 | 8.5 | 7.5 |
| 62.5° | 3112.6 | 658.9 | 70.3 | 38.3 | 36.2 | 31.9 | 19.2 | 10.6 | 6.4 | 4.3 | 3.2 |
| 65° | 2847.6 | 541.8 | 62.8 | 29.8 | 27.7 | 23.4 | 11.7 | 6.4 | 3.2 | 1.1 | 0.0 |
| 67.5° | 2265.3 | 384.3 | 55.4 | 22.4 | 19.2 | 14.9 | 7.5 | 4.3 | 1.1 | 0.0 | 0.0 |
| 70° | 1306.2 | 207.6 | 45.8 | 16.0 | 12.8 | 9.6 | 5.3 | 2.1 | 0.0 | 0.0 | 0.0 |
| 72.5° | 436.5 | 96.9 | 35.1 | 10.6 | 9.6 | 7.5 | 3.2 | 1.1 | 0.0 | 0.0 | 0.0 |
| 75° | 95.8 | 57.5 | 23.4 | 7.5 | 6.4 | 5.3 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 77.5° | 36.2 | 40.5 | 11.7 | 5.3 | 4.3 | 3.2 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 80° | 13.8 | 26.6 | 5.3 | 3.2 | 3.2 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 7.5 | 10.6 | 3.2 | 2.1 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 4.3 | 5.3 | 2.1 | 1.1 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 2.1 | 1.1 | 1.1 | 1.1 | 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 |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v6.13

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

## Test Information

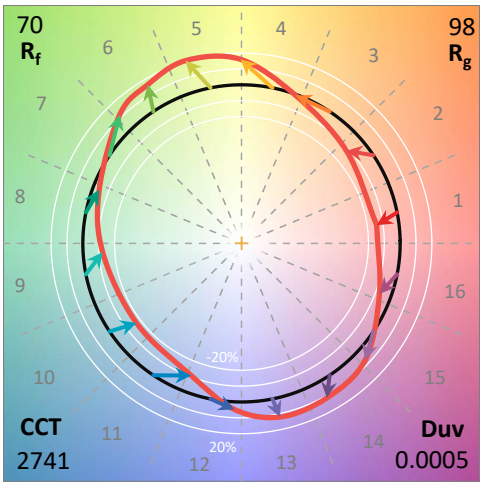
| | |
|---|---|
| Test Method: | LM-79-2008 |
| Report Number: | SP1-1908-441-1-R4 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 10/28/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | **SA1C-727-U-5WQ** |
| Description: | McGRAW EDISON ROADWAY AND AREA LUMINAIRE |

***THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.***TESTED IN SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 2741 | CRI (Ra): | 71.5 | | |
| CIE u': | 0.2605 | R1: | 69.2 | R9: | -16.1 |
| CIE v': | 0.5272 | R2: | 79.4 | R10: | 51.4 |
| Duv: | 0.0005 | R3: | 87.8 | R11: | 63.1 |
| CIE x: | 0.4573 | R4: | 69.4 | R12: | 42.0 |
| CIE y: | 0.4113 | R5: | 66.4 | R13: | 70.2 |
| CIE z: | 0.1313 | R6: | 69.8 | R14: | 92.4 |
| Peak Wavelength (nm): | 602 | R7: | 79.8 | | |
| Dominant Wavelength (nm): | 583 | R8: | 50.1 | | |
| Purity: | 61.2 | | | | |

| | |
|---|---|
| Rf: | 69.9 |
| Rg: | 98.3 |




## Test Conditions

| | |
|---|---|
| Stabilization Time: | 56M |
| Operation Time: | 12H |
| Room Temperature (°C) / RH%: | 25.3./42% |
| Sphere Temperature (°C): | 25.7 |

Cooper Lighting Solutions Photometric Lab
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REPORT NUMBER: SP1-1908-441-1-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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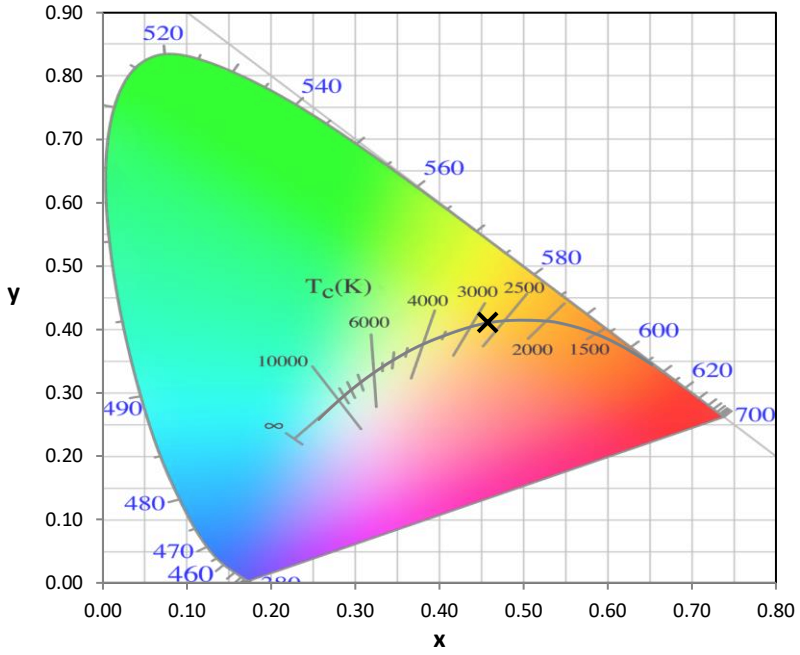
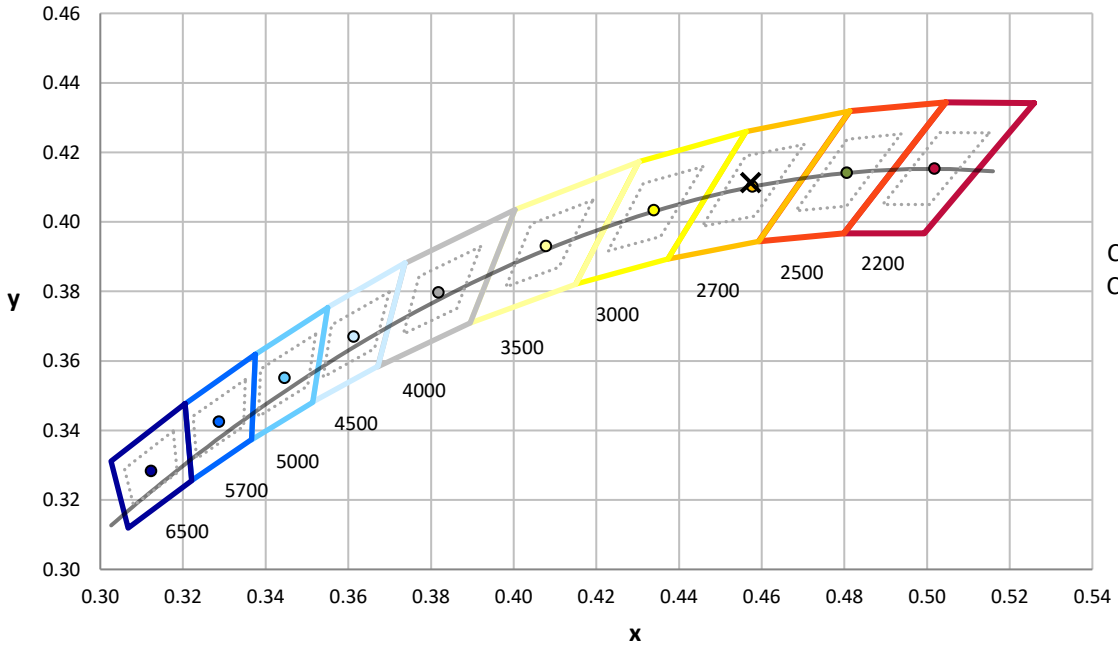
REPORT NUMBER: SP1-1908-441-1-R4

## CIE 1931 Chromaticity Diagram




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




CCT = 2741K
CIE x = 0.4573
CIE y = 0.4113
Duv = 0.0005

Point lies inside the ANSI 2700K 4-step quadrangle

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

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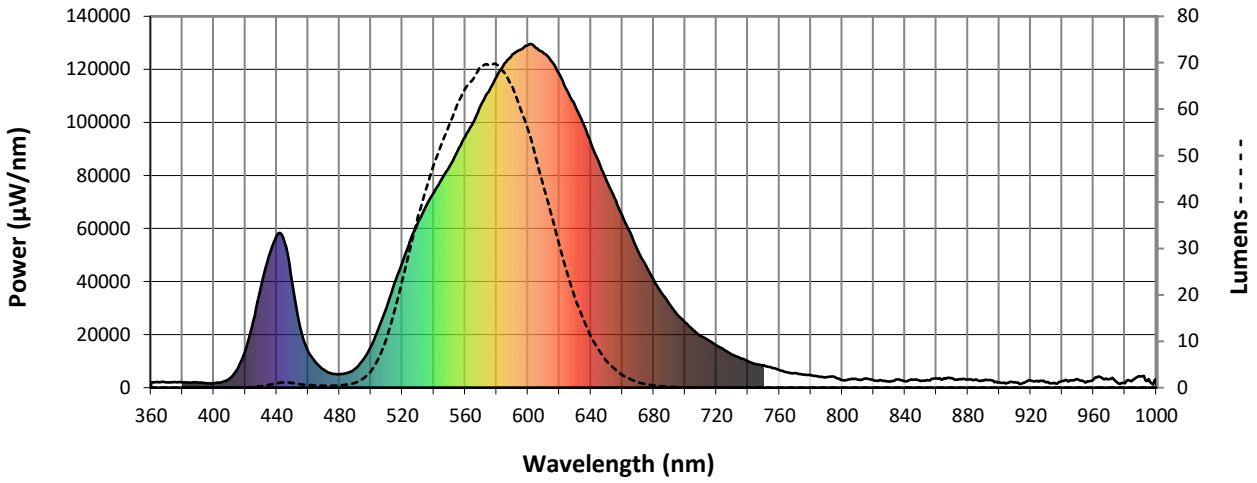
## Photopic Flux vs. Wavelength




**Photopic Lumens: 6211.7**

| 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 | 2044 | 0.0 | 490 | 7179 | 1.0 | 620 | 118034 | 30.7 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 1.9 | 625 | 111884 | 24.7 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 3.4 | 630 | 106119 | 19.2 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 6.3 | 635 | 99706 | 15.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 10.4 | 640 | 92142 | 11.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 16.3 | 645 | 84987 | 8.2 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 22.9 | 650 | 78016 | 5.7 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 29.7 | 655 | 71541 | 4.1 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 36.7 | 660 | 64863 | 2.7 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 42.5 | 665 | 58485 | 1.9 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.0 | 540 | 73435 | 47.8 | 670 | 51641 | 1.1 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.0 | 545 | 78677 | 52.4 | 675 | 46030 | 0.8 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 0.0 | 550 | 83331 | 56.6 | 680 | 40590 | 0.5 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 0.1 | 555 | 89120 | 60.9 | 685 | 35691 | 0.3 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 0.3 | 560 | 94613 | 64.3 | 690 | 31631 | 0.2 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 0.6 | 565 | 99818 | 66.4 | 695 | 27437 | 0.1 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 0.9 | 570 | 106526 | 69.3 | 700 | 24589 | 0.1 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 1.1 | 575 | 111610 | 69.4 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 1.0 | 580 | 117163 | 69.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 0.8 | 585 | 122201 | 67.9 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 0.6 | 590 | 125662 | 65.0 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 0.5 | 595 | 127415 | 60.4 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 0.4 | 600 | 129155 | 55.7 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 0.4 | 605 | 128057 | 49.6 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 0.5 | 610 | 126031 | 43.3 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 0.7 | 615 | 123059 | 37.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

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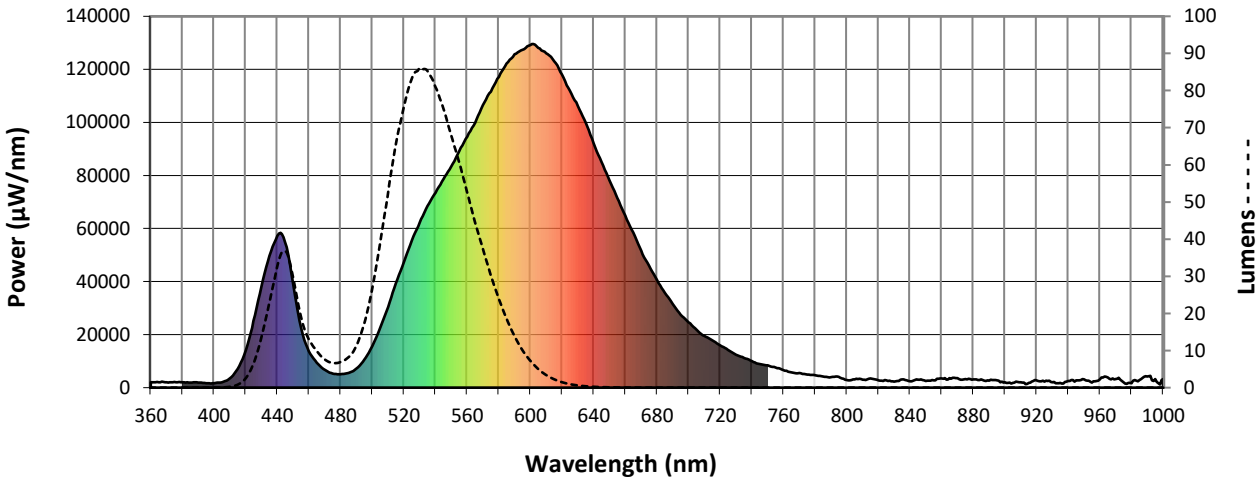
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: 6474.3** **S/P: 1.04**

| 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 | 2044 | 0.0 | 490 | 7179 | 6.0 | 620 | 118034 | 0.1 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 8.6 | 625 | 111884 | 0.1 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 12.5 | 630 | 106119 | 0.0 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 17.3 | 635 | 99706 | 0.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 21.8 | 640 | 92142 | 0.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 25.7 | 645 | 84987 | 0.0 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 27.5 | 650 | 78016 | 0.0 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 28.1 | 655 | 71541 | 0.0 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 27.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 24.7 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.1 | 540 | 73435 | 21.5 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.5 | 545 | 78677 | 18.3 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 1.6 | 550 | 83331 | 15.0 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 3.9 | 555 | 89120 | 12.0 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 8.1 | 560 | 94613 | 9.3 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 13.3 | 565 | 99818 | 7.0 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 19.1 | 570 | 106526 | 5.2 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 21.6 | 575 | 111610 | 3.7 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 18.1 | 580 | 117163 | 2.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 11.8 | 585 | 122201 | 1.8 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 8.1 | 590 | 125662 | 1.2 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 6.2 | 595 | 127415 | 0.8 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 4.8 | 600 | 129155 | 0.5 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 4.1 | 605 | 128057 | 0.4 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 4.1 | 610 | 126031 | 0.2 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 4.6 | 615 | 123059 | 0.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

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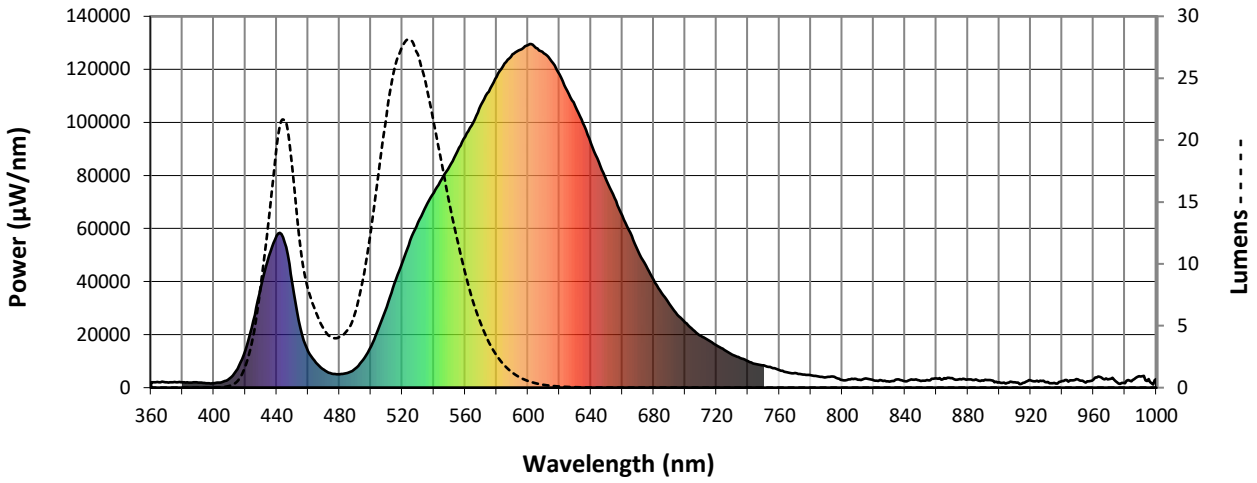
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: 2145.7** **M/P: 0.35**

| 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 | 2044 | 0.0 | 490 | 7179 | 11.1 | 620 | 118034 | 1.5 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 16.9 | 625 | 111884 | 0.9 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 26.0 | 630 | 106119 | 0.6 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 38.2 | 635 | 99706 | 0.4 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 51.6 | 640 | 92142 | 0.2 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 65.1 | 645 | 84987 | 0.1 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 75.2 | 650 | 78016 | 0.1 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 82.9 | 655 | 71541 | 0.1 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 86.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.1 | 535 | 68520 | 85.4 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.2 | 540 | 73435 | 81.1 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.7 | 545 | 78677 | 75.4 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 2.3 | 550 | 83331 | 68.1 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 6.2 | 555 | 89120 | 60.9 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 13.0 | 560 | 94613 | 52.9 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 22.2 | 565 | 99818 | 44.8 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 32.0 | 570 | 106526 | 37.6 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 36.7 | 575 | 111610 | 30.4 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 30.4 | 580 | 117163 | 24.1 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 19.7 | 585 | 122201 | 18.7 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 13.2 | 590 | 125662 | 14.0 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 10.0 | 595 | 127415 | 10.2 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 7.7 | 600 | 129155 | 7.3 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 6.7 | 605 | 128057 | 5.0 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 6.9 | 610 | 126031 | 3.4 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 8.1 | 615 | 123059 | 2.3 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

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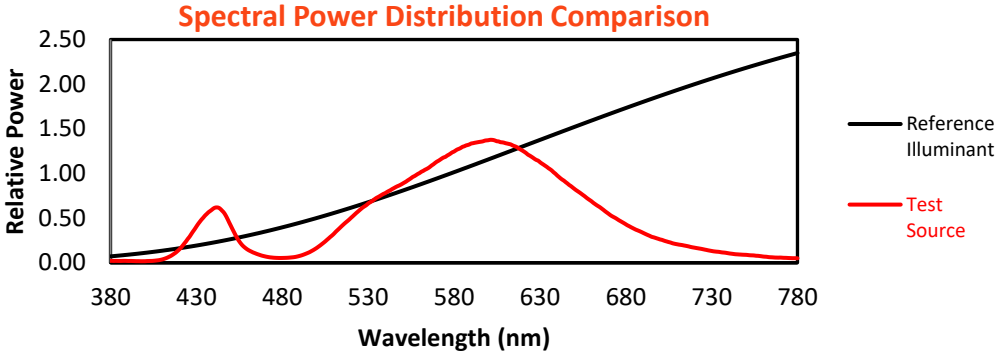
# TM-30-18

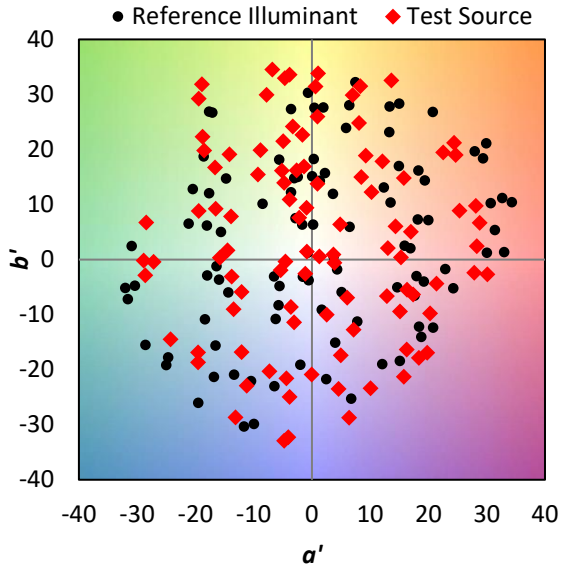
## Summary

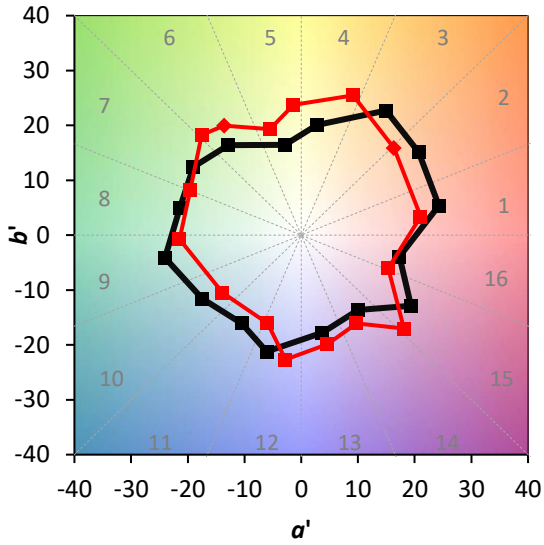
$R_f$ = 69.9
$R_g$ = 98.3
CIE $R_a$ = 71.5
$R_9$ = -16.1

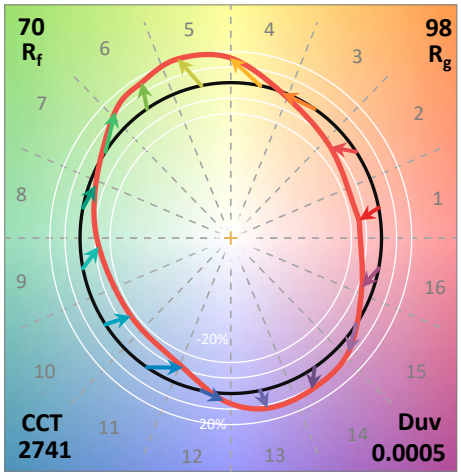
## Spectral Power Distribution Comparison

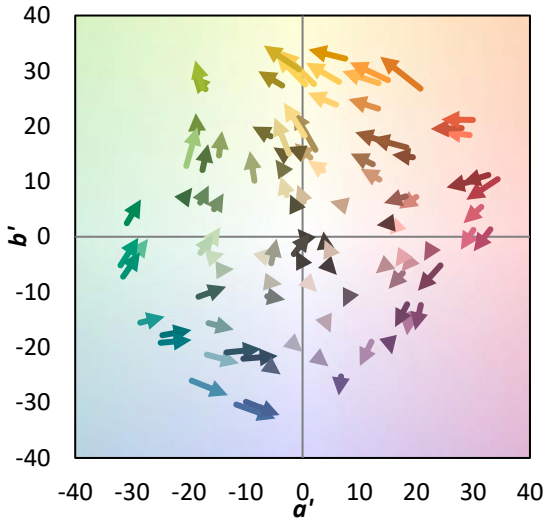



## Color Vector Graphics



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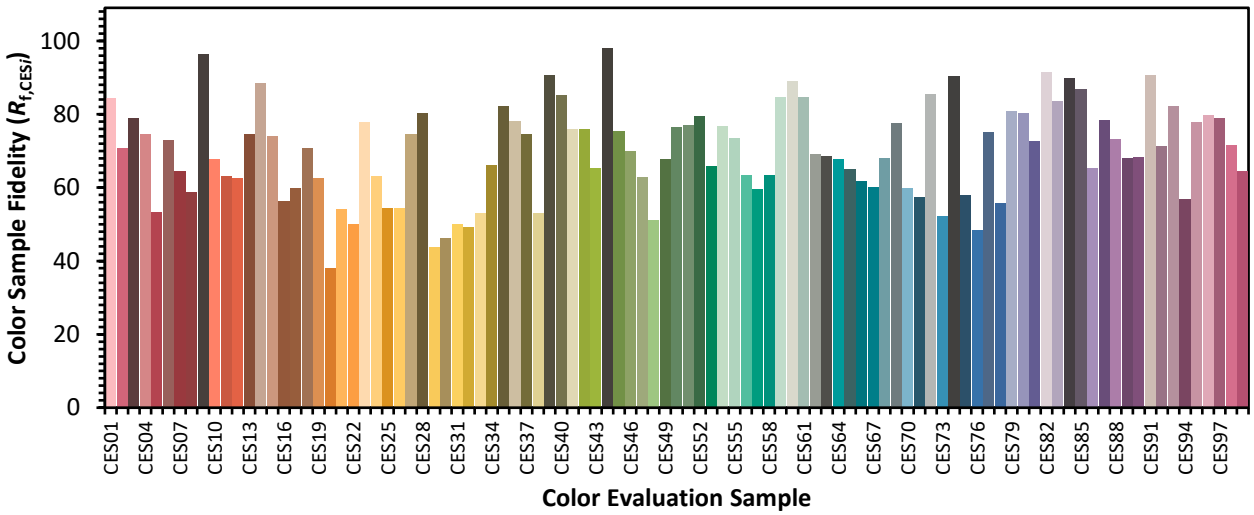
## TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 | |



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Peachtree City, GA 30269

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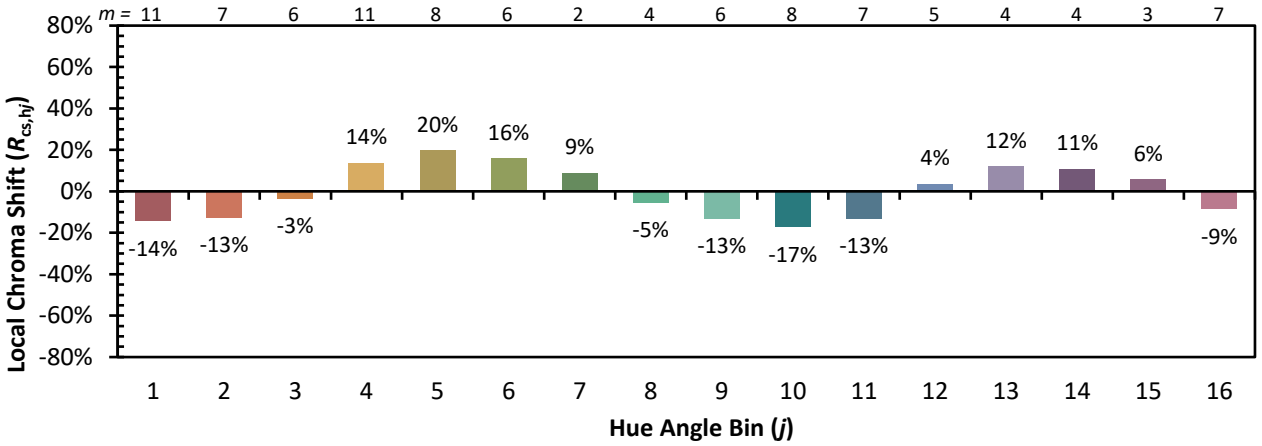
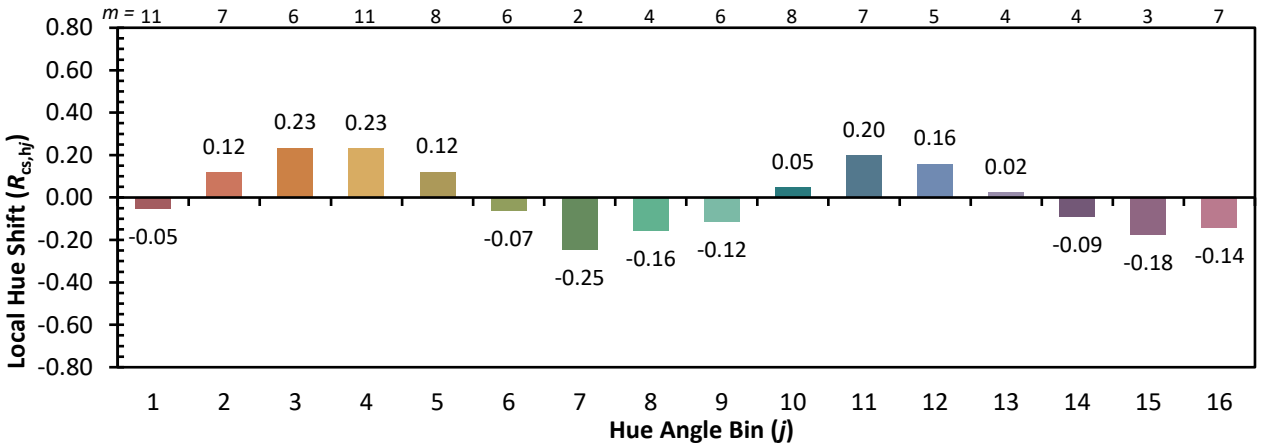
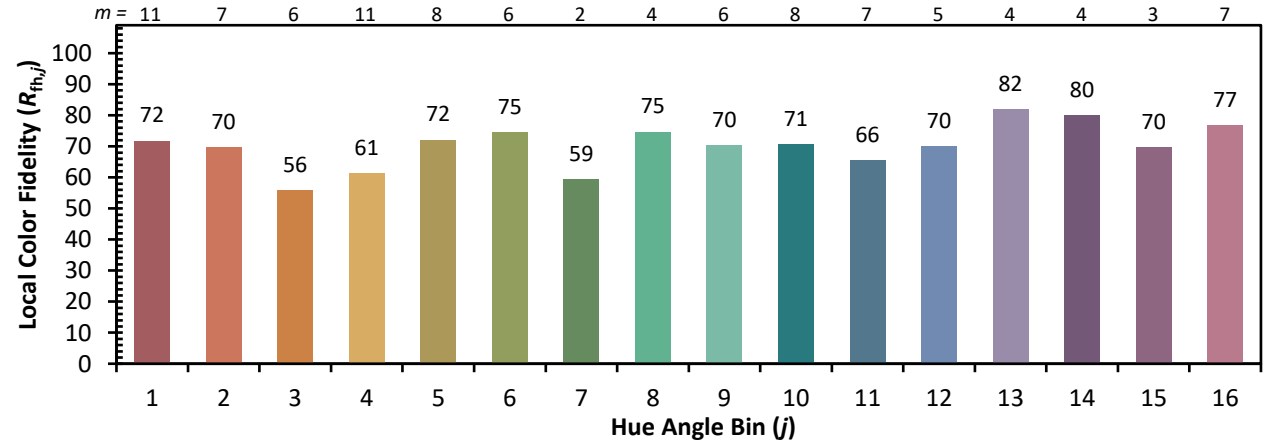
## TM-30-18

### Color Rendition by Hue-Angle Bin



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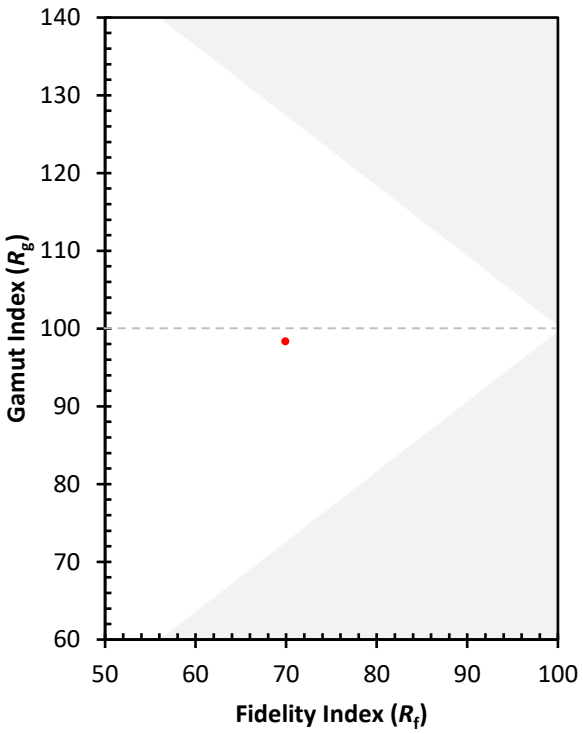
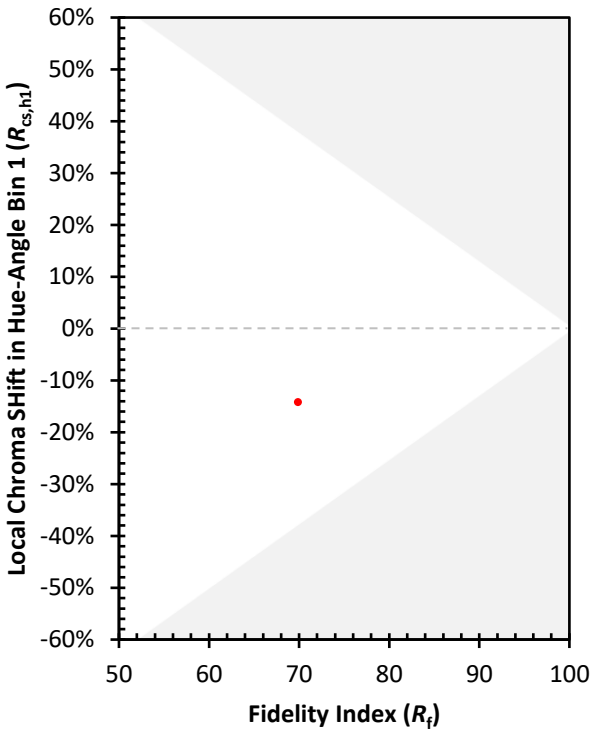
**TM-30-18**

## Measure Comparisons




(END OF REPORT)