

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: P629204

Luminaire Tested: GWS-SA1B-727-U-T3-W-GRSWH

Issue Date: 1/10/2023

Test Information

Test Method: LM-79-2019
Report Number: P629204
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-25)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 1/10/2023
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: McGRAW-EDISON
Catalog Number: GWS-SA1B-727-U-T3-W-GRSWH
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH
Light Source: (16) 2700K CCT, 70 CRI LEDS
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 2558.2 lumens
Efficiency: N/A
Efficacy: 102.3 lumens/watt
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')
IES Classification: Type II - Short
BUG Rating: B1 - U0 - G1

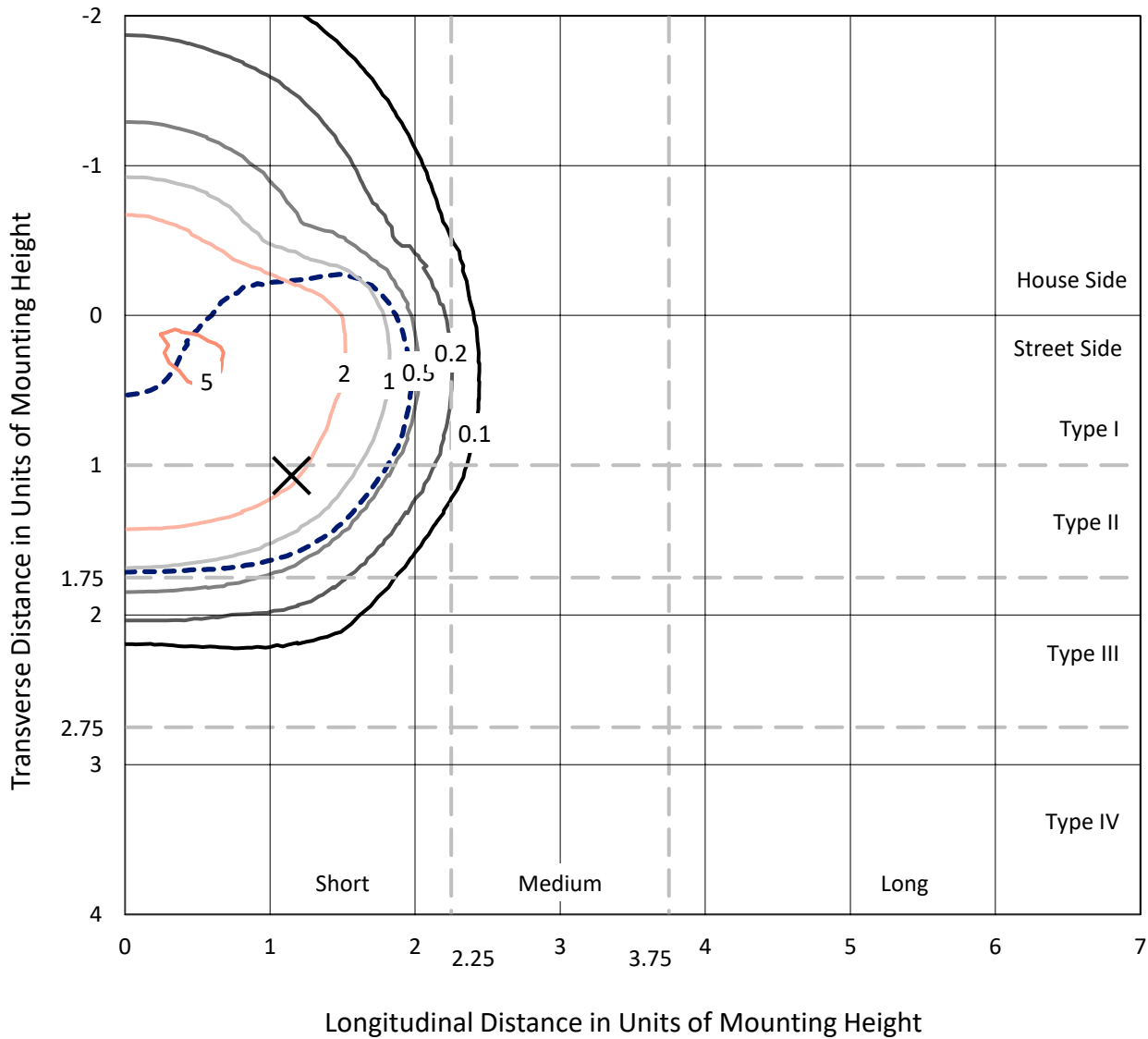
Input Watts (W): 25
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 0
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



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Iso-Footcandle Lines of Horizontal Illumination

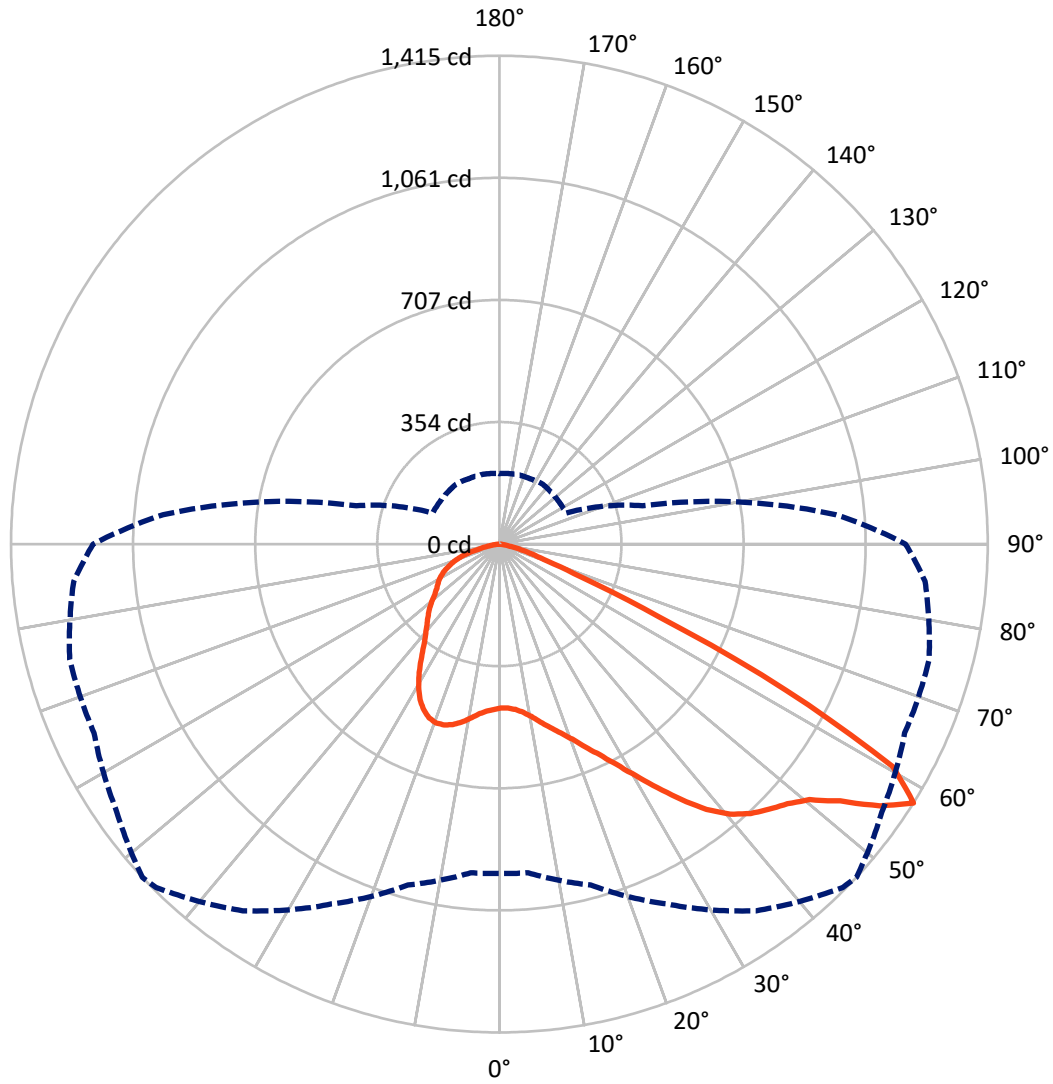
✕ Max cd
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 5.3 fc
 Type II - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 47-Deg Lateral - - - Horizontal Cone Through 57.5-Deg Vertical

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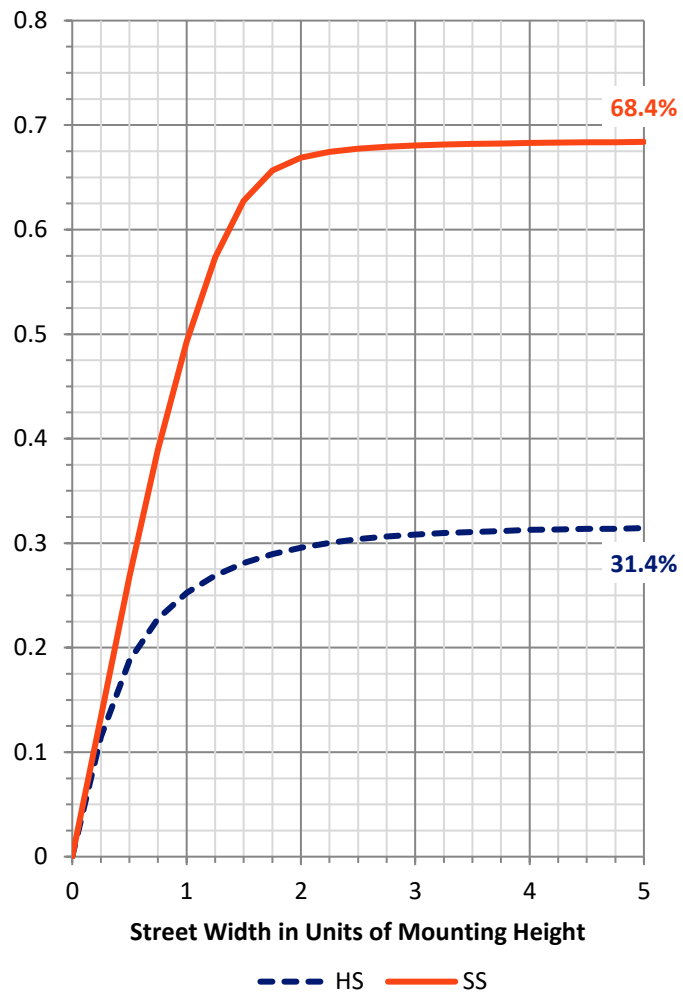
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 809.7 | 0.0 | 809.7 |
| | % Fixture | 31.6 | 0.0 | 31.6 |
| Street Side | Lumens | 1748.5 | 0.0 | 1748.5 |
| | % Fixture | 68.4 | 0.0 | 68.4 |
| Total | Lumens | 2558.2 | 0.0 | 2558.2 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 46.8 | 1.8 |
| 10°-20° | 153.9 | 6.0 |
| 20°-30° | 277.1 | 10.8 |
| 30°-40° | 418.6 | 16.4 |
| 40°-50° | 563.6 | 22.0 |
| 50°-60° | 677.3 | 26.5 |
| 60°-70° | 329.9 | 12.9 |
| 70°-80° | 81.3 | 3.2 |
| 80°-90° | 9.8 | 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° | 2558.2 | 100.0 |
| 0°-180° | 2558.2 | 100.0 |

Coefficient of Utilization



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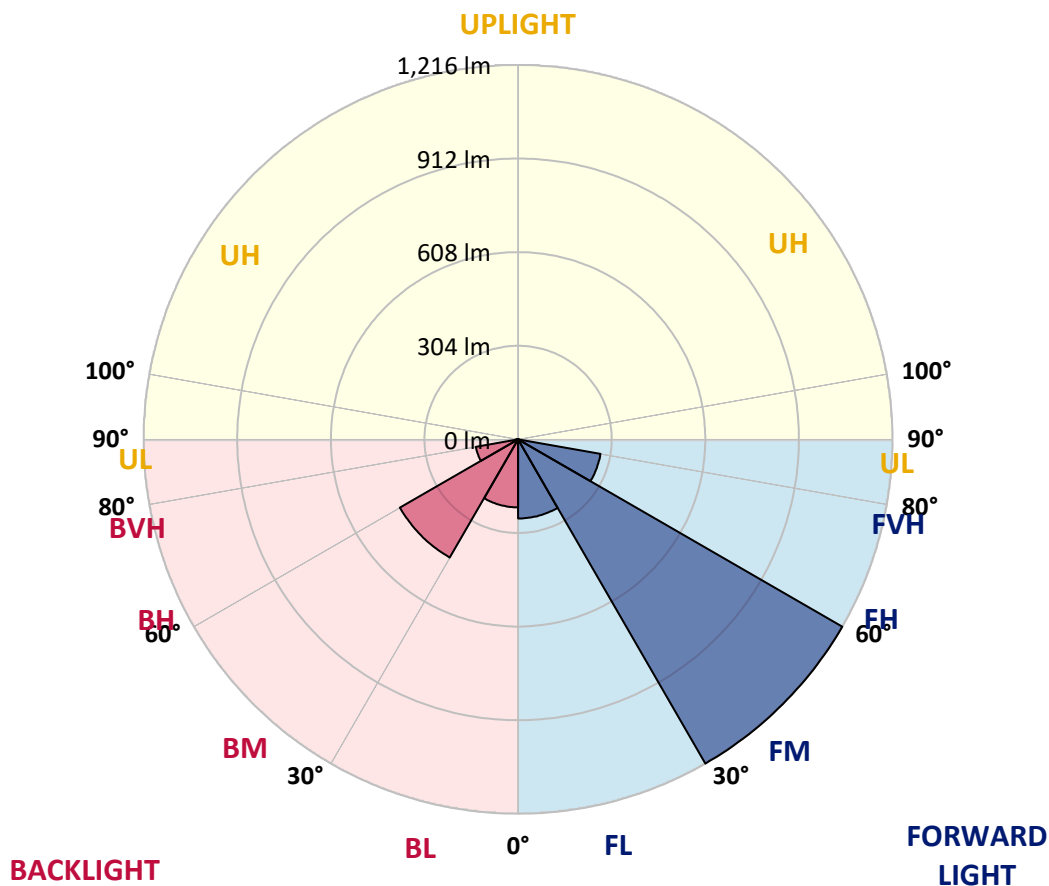
CATALOG NUMBER: GWS-SA1B-727-U-T3-W-GRSWH

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|--------|
| | | | B | U | G |
| FL (0°-30°) | 257.0 | 10.0 | | | |
| FM (30°-60°) | 1216.1 | 47.5 | | | |
| FH (60°-80°) | 271.9 | 10.6 | | | G0/660 |
| FVH (80°-90°) | 3.7 | 0.1 | | | G0/10 |
| BL (0°-30°) | 220.9 | 8.6 | B1/500 | | |
| BM (30°-60°) | 443.5 | 17.3 | B1/1000 | | |
| BH (60°-80°) | 139.3 | 5.4 | B1/500 | | G1/500 |
| BVH (80°-90°) | 6.1 | 0.2 | | | G0/10 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B1-U0-G1

Type II Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 47° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 |
| 2.5° | 473.6 | 473.3 | 473.3 | 474.6 | 474.6 | 475.1 | 475.7 | 476.4 | 476.6 | 475.5 | 473.1 |
| 5° | 478.7 | 478.7 | 478.7 | 479.8 | 479.8 | 480.2 | 481.1 | 481.3 | 481.1 | 479.4 | 477.0 |
| 7.5° | 486.9 | 486.9 | 487.1 | 488.4 | 489.5 | 490.1 | 491.6 | 491.4 | 490.8 | 488.0 | 485.0 |
| 10° | 500.2 | 500.9 | 501.5 | 503.0 | 505.1 | 506.7 | 507.7 | 507.7 | 506.9 | 502.6 | 498.7 |
| 12.5° | 519.1 | 520.0 | 520.6 | 521.9 | 523.6 | 526.2 | 528.6 | 528.6 | 527.5 | 522.1 | 516.3 |
| 15° | 541.2 | 542.1 | 541.9 | 542.3 | 545.5 | 549.2 | 551.1 | 552.4 | 552.8 | 545.3 | 536.3 |
| 17.5° | 566.6 | 567.5 | 566.6 | 565.3 | 565.7 | 571.5 | 575.0 | 579.7 | 582.5 | 572.4 | 558.0 |
| 20° | 589.6 | 588.7 | 588.7 | 589.6 | 590.9 | 598.0 | 603.1 | 610.9 | 614.3 | 602.1 | 579.7 |
| 22.5° | 613.9 | 615.8 | 614.9 | 614.9 | 620.1 | 631.9 | 638.1 | 648.2 | 651.9 | 636.0 | 605.9 |
| 25° | 645.2 | 647.0 | 646.5 | 647.0 | 653.0 | 669.7 | 676.0 | 694.7 | 698.3 | 675.5 | 634.9 |
| 27.5° | 679.6 | 682.4 | 683.7 | 683.3 | 692.9 | 714.9 | 722.6 | 748.6 | 755.3 | 719.8 | 665.9 |
| 30° | 724.3 | 727.3 | 728.4 | 728.0 | 739.4 | 769.2 | 778.0 | 807.7 | 817.1 | 772.2 | 705.2 |
| 32.5° | 776.1 | 779.1 | 782.3 | 783.6 | 798.2 | 828.7 | 841.4 | 872.1 | 885.7 | 832.8 | 752.7 |
| 35° | 827.4 | 830.0 | 836.3 | 846.4 | 866.3 | 897.5 | 908.7 | 939.0 | 952.1 | 895.8 | 810.0 |
| 37.5° | 884.2 | 885.9 | 891.3 | 905.2 | 934.0 | 963.7 | 974.8 | 1003.8 | 1005.4 | 956.6 | 874.9 |
| 40° | 946.3 | 946.3 | 945.2 | 958.9 | 989.0 | 1018.9 | 1028.6 | 1045.3 | 1036.5 | 1003.4 | 938.1 |
| 42.5° | 998.9 | 998.0 | 998.9 | 1011.8 | 1034.1 | 1058.4 | 1066.8 | 1063.6 | 1052.4 | 1039.3 | 995.3 |
| 45° | 1046.4 | 1047.0 | 1054.8 | 1064.7 | 1076.3 | 1090.7 | 1095.6 | 1077.3 | 1067.2 | 1068.1 | 1041.0 |
| 47.5° | 1078.6 | 1079.3 | 1097.3 | 1113.9 | 1121.0 | 1125.5 | 1123.3 | 1098.0 | 1092.8 | 1102.5 | 1076.3 |
| 50° | 1082.9 | 1086.4 | 1117.5 | 1151.5 | 1169.1 | 1169.7 | 1163.7 | 1132.8 | 1131.3 | 1142.2 | 1095.2 |
| 52.5° | 1083.8 | 1087.2 | 1126.1 | 1187.3 | 1233.1 | 1242.8 | 1235.9 | 1203.7 | 1188.0 | 1177.0 | 1118.4 |
| 55° | 1080.6 | 1084.4 | 1127.4 | 1211.4 | 1299.1 | 1337.7 | 1338.4 | 1292.8 | 1242.8 | 1235.5 | 1184.6 |
| 57.5° | 954.0 | 955.5 | 1022.1 | 1150.2 | 1296.5 | 1406.1 | 1414.5 | 1352.6 | 1295.4 | 1288.5 | 1237.6 |
| 60° | 664.6 | 670.6 | 743.0 | 912.1 | 1089.2 | 1282.3 | 1309.4 | 1291.3 | 1253.1 | 1203.0 | 1061.9 |
| 62.5° | 332.8 | 338.0 | 410.6 | 570.5 | 751.2 | 903.7 | 932.7 | 951.9 | 960.9 | 907.2 | 723.0 |
| 65° | 143.3 | 147.2 | 192.3 | 298.0 | 425.2 | 498.9 | 509.0 | 532.0 | 588.3 | 524.9 | 389.6 |
| 67.5° | 95.8 | 98.4 | 121.4 | 181.8 | 250.5 | 255.3 | 253.8 | 258.7 | 270.9 | 223.7 | 176.0 |
| 70° | 73.5 | 75.6 | 91.1 | 133.2 | 180.1 | 154.1 | 145.9 | 132.4 | 143.7 | 146.5 | 142.7 |
| 72.5° | 53.3 | 55.0 | 66.6 | 90.9 | 112.8 | 98.4 | 97.1 | 104.0 | 119.5 | 123.8 | 121.4 |
| 75° | 34.4 | 35.2 | 42.3 | 49.8 | 58.2 | 63.2 | 65.7 | 78.2 | 93.9 | 97.1 | 94.3 |
| 77.5° | 23.0 | 23.6 | 27.7 | 32.0 | 33.1 | 33.3 | 34.2 | 39.8 | 50.5 | 56.5 | 55.9 |
| 80° | 12.0 | 12.0 | 13.5 | 13.5 | 15.5 | 18.5 | 19.3 | 23.0 | 27.9 | 30.9 | 31.2 |
| 82.5° | 4.7 | 4.9 | 5.8 | 6.4 | 7.7 | 9.5 | 10.1 | 12.0 | 14.6 | 16.8 | 18.7 |
| 85° | 1.9 | 2.1 | 2.4 | 2.8 | 3.4 | 4.3 | 4.5 | 5.2 | 6.9 | 8.6 | 9.7 |
| 87.5° | 0.0 | 0.0 | 0.2 | 0.2 | 0.4 | 0.6 | 0.6 | 0.9 | 1.1 | 1.9 | 2.6 |
| 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: P629204

CATALOG NUMBER: GWS-SA1B-727-U-T3-W-GRSWH

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 | 474.4 |
| 2.5° | 475.9 | 473.1 | 475.9 | 476.8 | 479.1 | 480.0 | 478.5 | 478.3 | 478.3 | 476.1 | 475.5 |
| 5° | 479.1 | 476.6 | 479.4 | 480.7 | 484.1 | 486.2 | 486.7 | 488.4 | 489.5 | 488.6 | 488.4 |
| 7.5° | 487.1 | 483.9 | 486.9 | 488.8 | 493.3 | 496.8 | 498.3 | 502.1 | 504.9 | 504.5 | 504.3 |
| 10° | 501.1 | 496.8 | 500.2 | 503.4 | 508.4 | 512.5 | 512.7 | 514.8 | 517.6 | 516.8 | 516.3 |
| 12.5° | 517.2 | 513.1 | 517.0 | 520.2 | 526.0 | 527.7 | 524.9 | 524.1 | 524.5 | 523.4 | 522.6 |
| 15° | 536.9 | 531.1 | 534.6 | 538.2 | 541.5 | 539.5 | 533.5 | 531.1 | 530.9 | 529.4 | 528.6 |
| 17.5° | 556.7 | 549.4 | 552.0 | 553.9 | 552.4 | 546.4 | 538.9 | 534.8 | 532.9 | 529.9 | 529.0 |
| 20° | 576.3 | 567.0 | 566.6 | 565.1 | 558.2 | 547.3 | 537.2 | 529.0 | 524.1 | 520.0 | 518.5 |
| 22.5° | 598.6 | 585.7 | 579.3 | 572.4 | 557.4 | 539.5 | 524.3 | 512.7 | 504.7 | 499.6 | 497.8 |
| 25° | 622.7 | 604.4 | 591.1 | 577.3 | 548.8 | 523.0 | 501.7 | 485.8 | 476.4 | 470.8 | 468.8 |
| 27.5° | 646.5 | 621.4 | 601.4 | 578.0 | 531.6 | 499.1 | 470.6 | 449.1 | 439.6 | 435.1 | 433.6 |
| 30° | 678.8 | 644.0 | 613.7 | 569.6 | 509.0 | 466.0 | 430.4 | 408.7 | 402.4 | 399.2 | 397.9 |
| 32.5° | 715.9 | 672.5 | 630.0 | 552.0 | 480.2 | 427.4 | 389.8 | 374.7 | 370.4 | 364.2 | 364.0 |
| 35° | 764.9 | 713.4 | 645.5 | 526.0 | 443.9 | 385.9 | 358.6 | 347.9 | 340.1 | 330.2 | 329.4 |
| 37.5° | 822.1 | 764.3 | 653.8 | 492.9 | 401.6 | 351.7 | 335.4 | 323.4 | 310.9 | 297.8 | 296.1 |
| 40° | 881.2 | 823.8 | 654.5 | 453.8 | 360.1 | 329.2 | 315.4 | 299.7 | 284.3 | 269.7 | 267.7 |
| 42.5° | 943.3 | 879.2 | 643.1 | 408.7 | 326.2 | 309.6 | 295.7 | 275.9 | 258.5 | 248.6 | 247.5 |
| 45° | 998.7 | 923.9 | 617.3 | 361.2 | 301.0 | 293.3 | 275.5 | 254.2 | 244.9 | 237.9 | 236.4 |
| 47.5° | 1042.3 | 953.6 | 582.5 | 318.6 | 280.6 | 276.5 | 253.3 | 242.4 | 235.3 | 228.8 | 227.3 |
| 50° | 1063.8 | 960.2 | 537.2 | 284.1 | 261.7 | 256.8 | 240.9 | 232.5 | 227.8 | 222.6 | 221.3 |
| 52.5° | 1090.4 | 967.8 | 498.1 | 255.0 | 243.2 | 236.6 | 230.6 | 223.9 | 220.5 | 217.2 | 216.2 |
| 55° | 1151.7 | 996.1 | 477.4 | 231.8 | 225.6 | 222.6 | 221.7 | 216.2 | 215.1 | 212.9 | 211.0 |
| 57.5° | 1176.6 | 977.9 | 428.7 | 212.9 | 211.6 | 212.1 | 214.2 | 209.1 | 208.0 | 205.4 | 204.1 |
| 60° | 946.3 | 739.1 | 290.3 | 196.6 | 200.0 | 202.8 | 205.0 | 199.8 | 198.3 | 197.9 | 196.2 |
| 62.5° | 606.3 | 454.7 | 202.6 | 181.3 | 186.5 | 189.9 | 191.2 | 186.3 | 185.2 | 188.7 | 188.9 |
| 65° | 315.6 | 247.7 | 164.4 | 165.0 | 169.3 | 174.5 | 177.0 | 175.3 | 174.9 | 178.6 | 178.8 |
| 67.5° | 161.1 | 151.5 | 143.3 | 145.7 | 149.1 | 155.8 | 161.8 | 169.3 | 171.9 | 172.3 | 172.5 |
| 70° | 137.3 | 133.0 | 128.9 | 130.4 | 134.1 | 137.7 | 143.5 | 147.2 | 142.9 | 141.8 | 141.4 |
| 72.5° | 116.9 | 113.7 | 111.7 | 113.4 | 115.4 | 114.7 | 113.0 | 114.7 | 115.4 | 115.6 | 115.8 |
| 75° | 90.9 | 88.5 | 87.0 | 87.2 | 87.2 | 84.9 | 81.6 | 79.7 | 77.6 | 75.8 | 75.8 |
| 77.5° | 55.7 | 56.1 | 57.6 | 57.4 | 57.2 | 56.3 | 53.1 | 51.4 | 46.2 | 44.7 | 44.7 |
| 80° | 31.8 | 32.4 | 33.9 | 34.4 | 34.4 | 33.3 | 30.1 | 28.1 | 25.8 | 24.7 | 24.5 |
| 82.5° | 19.3 | 20.2 | 21.1 | 21.5 | 21.7 | 20.4 | 17.6 | 16.1 | 14.8 | 13.8 | 13.8 |
| 85° | 10.1 | 10.5 | 11.4 | 11.6 | 11.0 | 9.7 | 8.2 | 7.5 | 6.2 | 6.0 | 6.0 |
| 87.5° | 2.8 | 3.0 | 3.4 | 2.8 | 2.6 | 1.9 | 1.1 | 0.9 | 0.4 | 0.2 | 0.2 |
| 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: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

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
 CIE u': 0.2605
 CIE v': 0.5272
 Duv: 0.0005
 CIE x: 0.4573
 CIE y: 0.4113
 CIE z: 0.1313
 Peak Wavelength (nm): 602
 Dominant Wavelength (nm): 583
 Purity: 61.2

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.5 | | |
| R1: | 69.2 | R9: | -16.1 |
| R2: | 79.4 | R10: | 51.4 |
| R3: | 87.8 | R11: | 63.1 |
| R4: | 69.4 | R12: | 42.0 |
| R5: | 66.4 | R13: | 70.2 |
| R6: | 69.8 | R14: | 92.4 |
| R7: | 79.8 | | |
| R8: | 50.1 | | |

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

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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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2700K 4-step quadrangle

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Photopic Flux vs. Wavelength



Photopic Lumens: 6211.7

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | 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 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

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 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

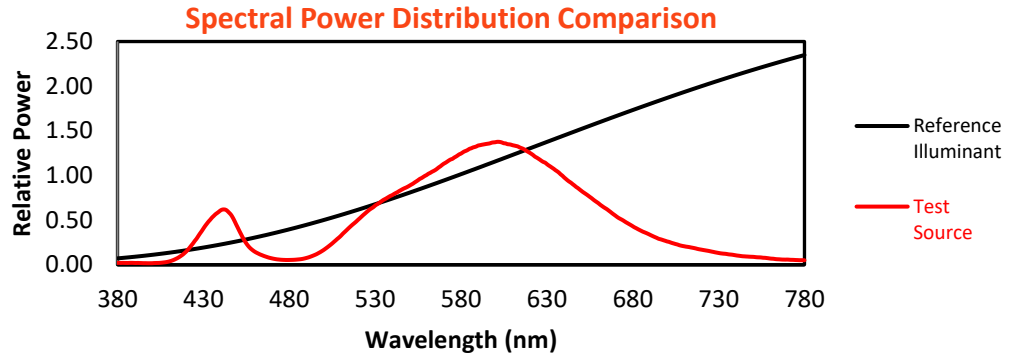
| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|----------------|-----------------------------------|-----------------------------|
| 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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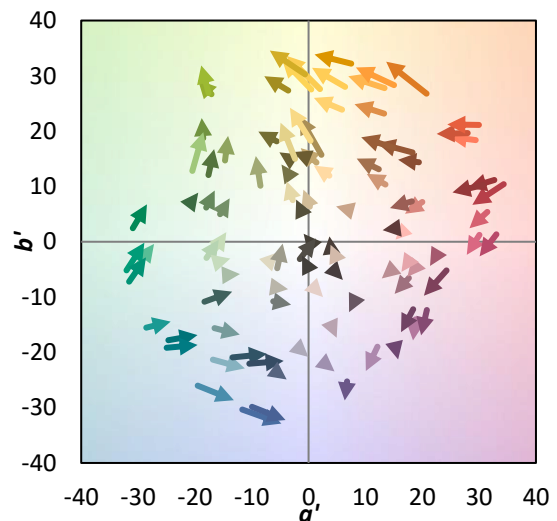
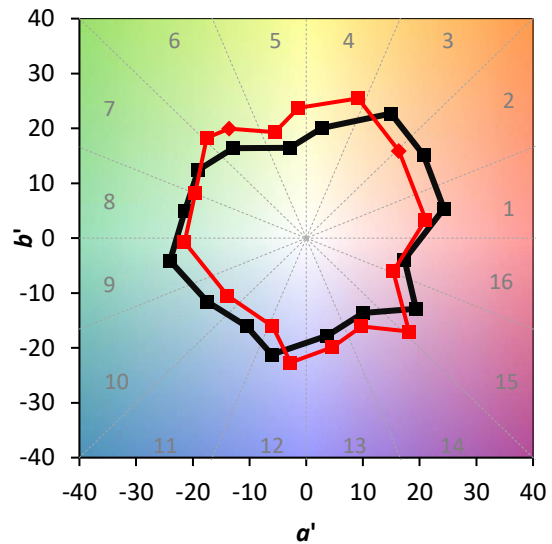
TM-30-18

Summary

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



Color Vector Graphics



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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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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)