

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: P437288

Luminaire Tested: **ISS-SA1C-727-U-SL3-HSS**

Issue Date: 12/9/2020

Test Information

Test Method: LM-79-08
Report Number: P437288
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-17)
Test Lab: INNOVATION CENTER
Issue Date: 12/9/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: McGRAW-EDISON
Catalog Number: ISS-SA1C-727-U-SL3-HSS
Description: IMPACT ELITE LED QUARTER SPHERE LUMINAIRE
(1) 70 CRI, 2700K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE III SPILL
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 3202 lumens
Efficiency: N/A
Efficacy: 93.6 lumens/watt
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')
IES Classification: Type III - Short
BUG Rating: B0 - U0 - G1

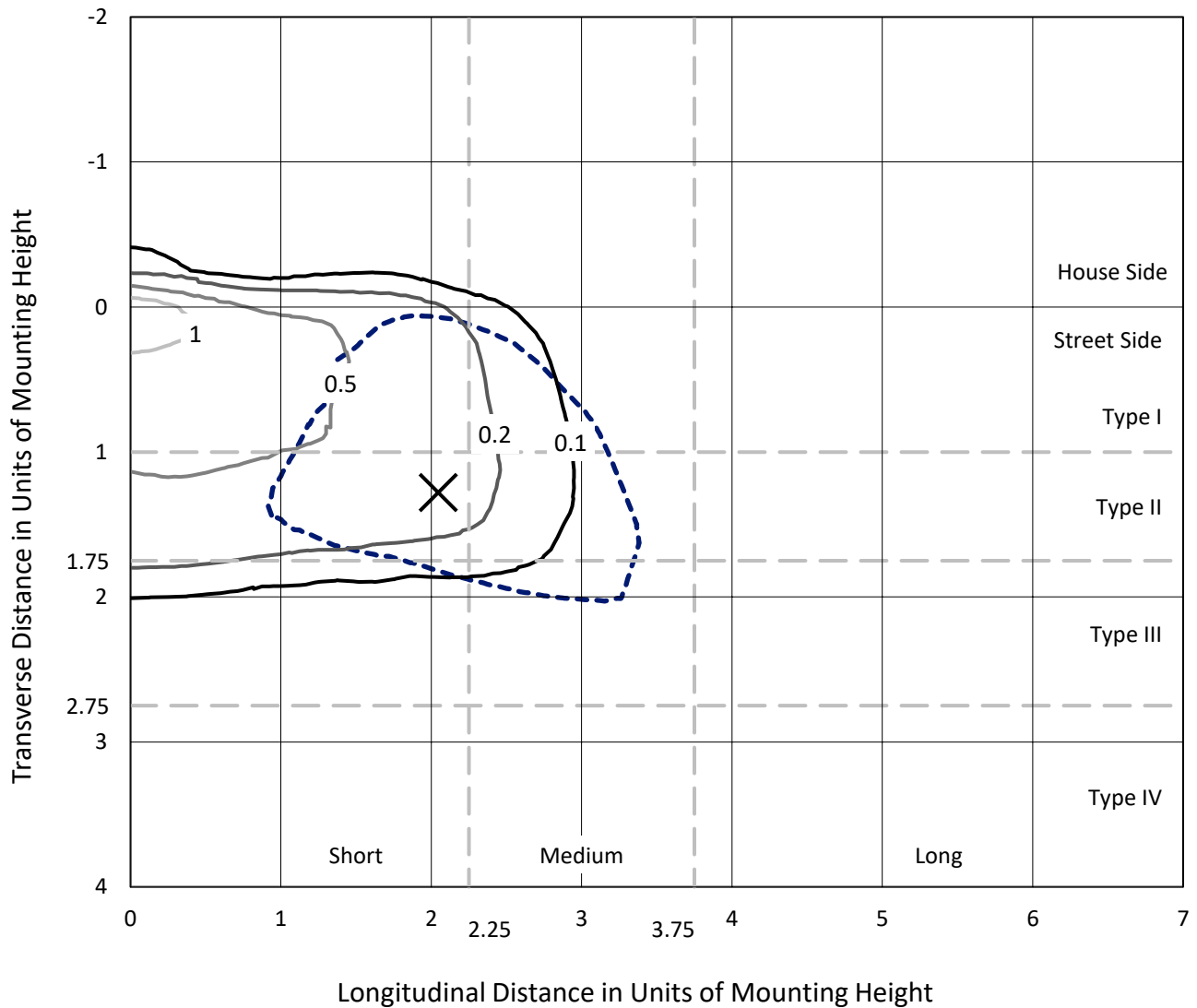
Input Watts (W): 34.2
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



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Iso-Footcandle Lines of Horizontal Illumination

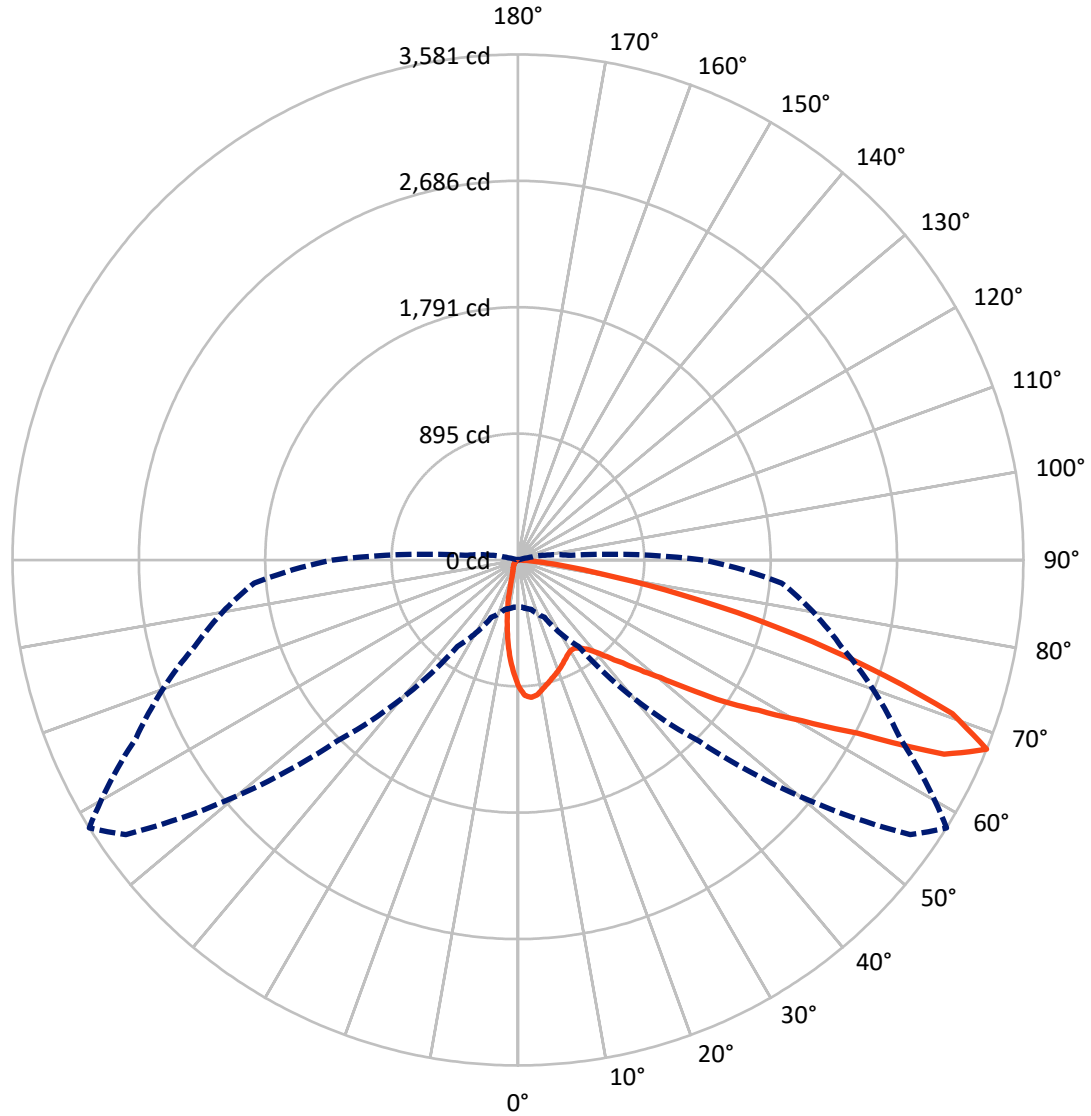
× Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 1.5 fc
 Type III - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

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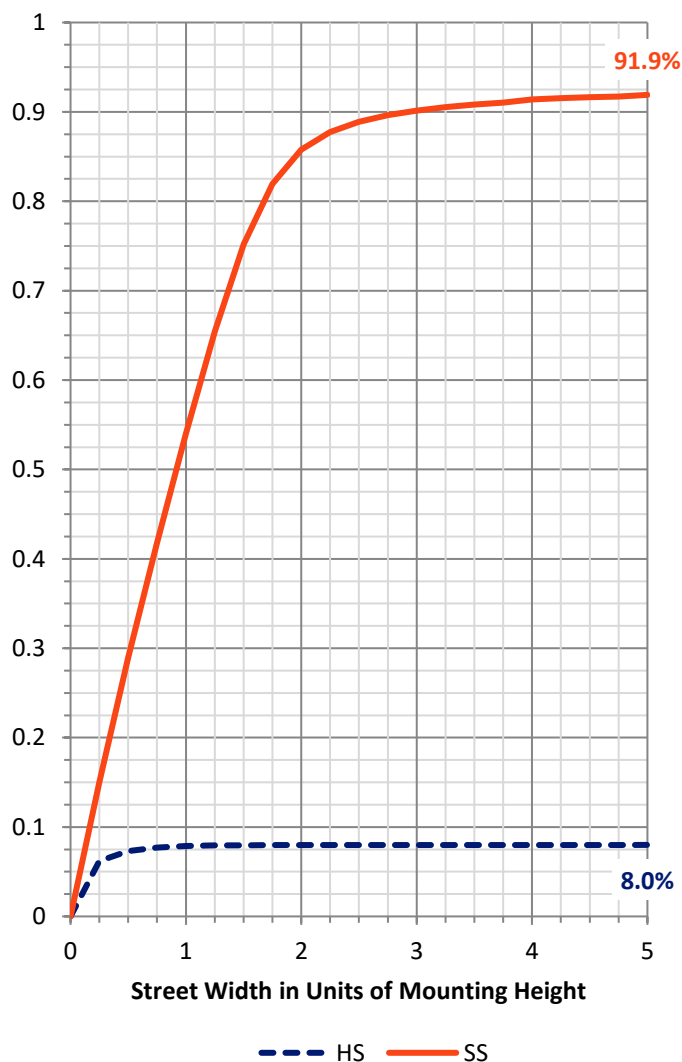
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 258.2 | 0.0 | 258.2 |
| | % Fixture | 8.1 | 0.0 | 8.1 |
| Street Side | Lumens | 2943.8 | 0.0 | 2943.8 |
| | % Fixture | 91.9 | 0.0 | 91.9 |
| Total | Lumens | 3202.0 | 0.0 | 3202.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 72.2 | 2.3 |
| 10°-20° | 152.1 | 4.8 |
| 20°-30° | 205.8 | 6.4 |
| 30°-40° | 283.1 | 8.8 |
| 40°-50° | 443.2 | 13.8 |
| 50°-60° | 746.6 | 23.3 |
| 60°-70° | 886.0 | 27.7 |
| 70°-80° | 384.8 | 12.0 |
| 80°-90° | 28.3 | 0.9 |
| 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° | 3202.0 | 100.0 |
| 0°-180° | 3202.0 | 100.0 |

Coefficient of Utilization



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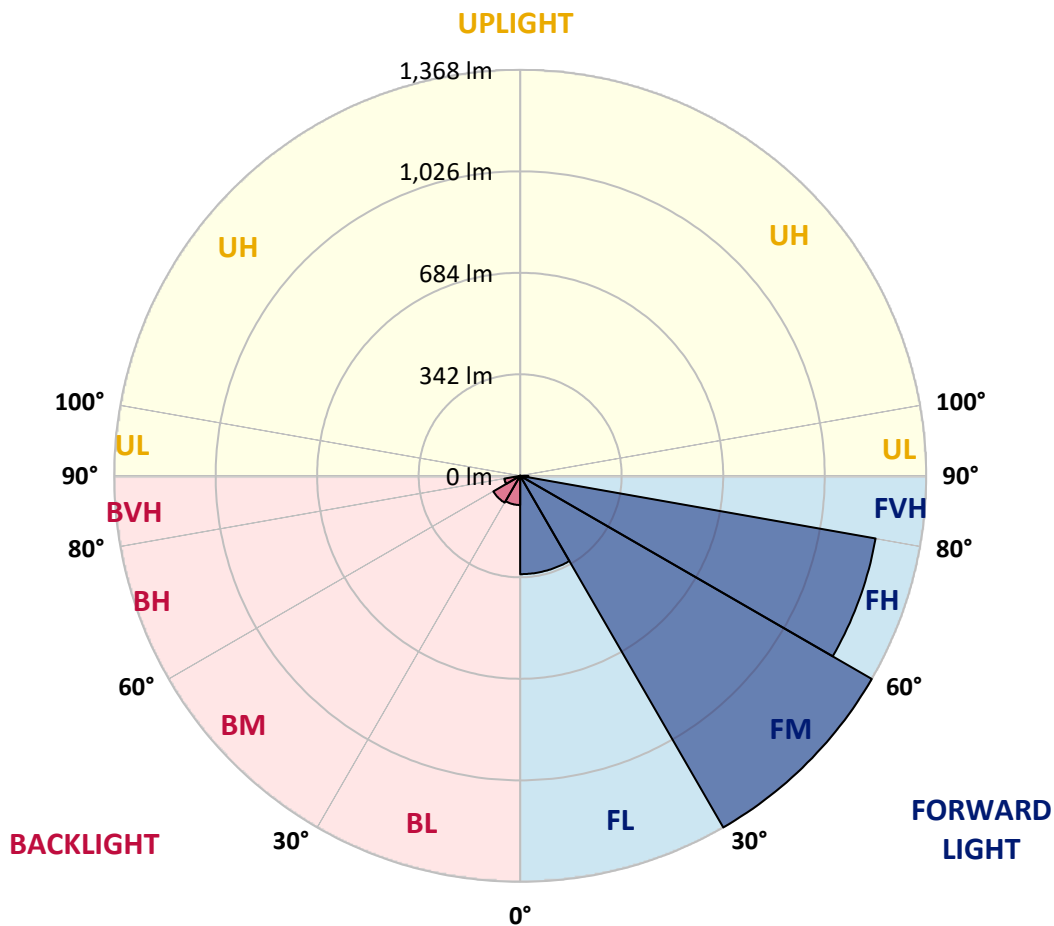
CATALOG NUMBER: ISS-SA1C-727-U-SL3-HSS

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 331.6 | 10.4 | | | |
| FM (30°-60°) | 1368.4 | 42.7 | | | |
| FH (60°-80°) | 1216.4 | 38.0 | | | G1/1800 |
| FVH (80°-90°) | 27.4 | 0.9 | | | G1/100 |
| BL (0°-30°) | 98.6 | 3.1 | B0/110 | | |
| BM (30°-60°) | 104.4 | 3.3 | B0/220 | | |
| BH (60°-80°) | 54.3 | 1.7 | B0/110 | | G0/110 |
| BVH (80°-90°) | 0.9 | 0.0 | | | G0/10 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B0-U0-G1

Type III Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 58° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 |
| 2.5° | 1006.3 | 1000.8 | 998.0 | 996.6 | 987.0 | 978.7 | 962.2 | 960.8 | 949.8 | 929.1 | 908.4 |
| 5° | 984.2 | 988.4 | 989.7 | 993.9 | 992.5 | 992.5 | 981.5 | 978.7 | 963.6 | 934.6 | 894.6 |
| 7.5° | 936.0 | 934.6 | 937.4 | 948.4 | 953.9 | 964.9 | 963.6 | 966.3 | 959.4 | 927.7 | 871.2 |
| 10° | 865.7 | 868.4 | 876.7 | 886.4 | 901.5 | 920.8 | 933.2 | 936.0 | 941.5 | 915.3 | 849.1 |
| 12.5° | 800.9 | 805.0 | 810.5 | 829.8 | 846.4 | 876.7 | 900.1 | 905.7 | 916.7 | 902.9 | 829.8 |
| 15° | 747.1 | 748.5 | 752.6 | 770.6 | 798.1 | 836.7 | 871.2 | 879.5 | 897.4 | 891.9 | 814.7 |
| 17.5° | 704.4 | 705.8 | 711.3 | 726.5 | 748.5 | 794.0 | 840.9 | 854.7 | 880.8 | 885.0 | 798.1 |
| 20° | 681.0 | 681.0 | 681.0 | 690.6 | 712.7 | 755.4 | 810.5 | 829.8 | 867.1 | 874.0 | 784.4 |
| 22.5° | 674.1 | 674.1 | 671.3 | 674.1 | 687.9 | 723.7 | 780.2 | 803.6 | 850.5 | 869.8 | 767.8 |
| 25° | 683.7 | 679.6 | 679.6 | 672.7 | 674.1 | 697.5 | 752.6 | 778.8 | 840.9 | 867.1 | 759.5 |
| 27.5° | 701.6 | 700.3 | 694.7 | 689.2 | 681.0 | 686.5 | 729.2 | 755.4 | 831.2 | 871.2 | 752.6 |
| 30° | 722.3 | 722.3 | 719.6 | 716.8 | 703.0 | 692.0 | 718.2 | 741.6 | 827.1 | 878.1 | 748.5 |
| 32.5° | 745.8 | 744.4 | 751.3 | 754.0 | 737.5 | 716.8 | 720.9 | 743.0 | 829.8 | 898.8 | 751.3 |
| 35° | 773.3 | 773.3 | 785.7 | 802.3 | 788.5 | 756.8 | 747.1 | 766.4 | 843.6 | 920.8 | 762.3 |
| 37.5° | 803.6 | 805.0 | 827.1 | 850.5 | 840.9 | 813.3 | 796.8 | 803.6 | 872.6 | 962.2 | 787.1 |
| 40° | 839.5 | 839.5 | 872.6 | 911.2 | 911.2 | 879.5 | 857.4 | 862.9 | 913.9 | 1021.4 | 831.2 |
| 42.5° | 878.1 | 882.2 | 929.1 | 976.0 | 989.7 | 960.8 | 937.4 | 944.3 | 980.1 | 1098.6 | 896.0 |
| 45° | 933.2 | 945.6 | 1006.3 | 1051.8 | 1079.3 | 1065.6 | 1035.2 | 1040.7 | 1066.9 | 1210.3 | 993.9 |
| 47.5° | 1031.1 | 1042.1 | 1094.5 | 1140.0 | 1174.5 | 1181.4 | 1167.6 | 1164.8 | 1175.8 | 1341.3 | 1117.9 |
| 50° | 1148.3 | 1157.9 | 1193.8 | 1232.4 | 1280.6 | 1322.0 | 1313.7 | 1309.5 | 1313.7 | 1484.6 | 1269.6 |
| 52.5° | 1264.1 | 1259.9 | 1302.7 | 1323.3 | 1390.9 | 1481.9 | 1517.7 | 1517.7 | 1495.6 | 1634.9 | 1418.4 |
| 55° | 1367.4 | 1385.4 | 1430.9 | 1468.1 | 1524.6 | 1633.5 | 1754.8 | 1770.0 | 1694.1 | 1783.7 | 1542.5 |
| 57.5° | 1355.0 | 1373.0 | 1457.0 | 1574.2 | 1741.0 | 1888.5 | 2007.1 | 2009.8 | 1899.5 | 1898.2 | 1695.5 |
| 60° | 1210.3 | 1211.7 | 1324.7 | 1502.5 | 1836.1 | 2256.6 | 2325.5 | 2311.7 | 2078.7 | 2058.1 | 1906.4 |
| 62.5° | 851.9 | 846.4 | 992.5 | 1218.6 | 1694.1 | 2457.8 | 2807.9 | 2703.2 | 2376.5 | 2308.9 | 2103.5 |
| 65° | 496.2 | 493.5 | 550.0 | 727.8 | 1283.4 | 2315.8 | 3301.4 | 3318.0 | 2768.0 | 2437.1 | 2062.2 |
| 67.5° | 333.6 | 336.3 | 362.5 | 449.4 | 748.5 | 1816.8 | 3392.4 | 3581.3 | 2985.8 | 2371.0 | 1876.1 |
| 70° | 245.4 | 245.4 | 266.0 | 330.8 | 443.9 | 1138.6 | 2963.7 | 3265.6 | 3028.5 | 2205.6 | 1570.1 |
| 72.5° | 175.1 | 175.1 | 204.0 | 267.4 | 362.5 | 587.2 | 2202.8 | 2588.8 | 2557.1 | 1830.6 | 1086.2 |
| 75° | 111.7 | 114.4 | 146.1 | 219.2 | 330.8 | 376.3 | 1494.3 | 1876.1 | 1783.7 | 1024.2 | 463.2 |
| 77.5° | 42.7 | 48.2 | 78.6 | 161.3 | 289.5 | 312.9 | 851.9 | 1182.7 | 941.5 | 358.4 | 124.1 |
| 80° | 15.2 | 15.2 | 26.2 | 82.7 | 204.0 | 257.8 | 445.2 | 587.2 | 306.0 | 86.8 | 46.9 |
| 82.5° | 2.8 | 2.8 | 9.6 | 34.5 | 100.6 | 179.2 | 259.2 | 289.5 | 119.9 | 28.9 | 27.6 |
| 85° | 0.0 | 0.0 | 1.4 | 6.9 | 23.4 | 17.9 | 103.4 | 97.9 | 37.2 | 12.4 | 17.9 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 |
| 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: ISS-SA1C-727-U-SL3-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 | 901.5 |
| 2.5° | 891.9 | 880.8 | 849.1 | 827.1 | 796.8 | 766.4 | 747.1 | 732.0 | 725.1 | 715.4 | 719.6 |
| 5° | 869.8 | 845.0 | 787.1 | 734.7 | 685.1 | 632.7 | 594.1 | 559.7 | 548.6 | 529.3 | 526.6 |
| 7.5° | 836.7 | 802.3 | 716.8 | 634.1 | 554.1 | 488.0 | 428.7 | 383.2 | 341.9 | 323.9 | 335.0 |
| 10° | 805.0 | 758.2 | 646.5 | 536.2 | 430.1 | 337.7 | 267.4 | 212.3 | 180.6 | 166.8 | 169.6 |
| 12.5° | 774.7 | 715.4 | 573.4 | 442.5 | 312.9 | 208.1 | 151.6 | 122.7 | 113.0 | 111.7 | 108.9 |
| 15° | 748.5 | 675.5 | 508.7 | 343.2 | 208.1 | 131.0 | 107.5 | 100.6 | 99.2 | 99.2 | 99.2 |
| 17.5° | 719.6 | 634.1 | 438.4 | 252.3 | 136.5 | 102.0 | 95.1 | 93.7 | 92.4 | 92.4 | 92.4 |
| 20° | 697.5 | 598.3 | 373.6 | 176.4 | 104.8 | 91.0 | 88.2 | 88.2 | 86.8 | 86.8 | 86.8 |
| 22.5° | 674.1 | 561.0 | 310.2 | 129.6 | 89.6 | 84.1 | 81.3 | 80.0 | 80.0 | 78.6 | 78.6 |
| 25° | 652.0 | 526.6 | 249.5 | 99.2 | 80.0 | 75.8 | 73.1 | 71.7 | 71.7 | 70.3 | 68.9 |
| 27.5° | 638.2 | 499.0 | 195.7 | 84.1 | 71.7 | 68.9 | 66.2 | 63.4 | 60.7 | 59.3 | 59.3 |
| 30° | 628.6 | 465.9 | 148.9 | 73.1 | 66.2 | 62.0 | 57.9 | 53.8 | 49.6 | 48.2 | 48.2 |
| 32.5° | 614.8 | 439.7 | 114.4 | 66.2 | 59.3 | 55.1 | 49.6 | 45.5 | 41.4 | 38.6 | 38.6 |
| 35° | 614.8 | 417.7 | 88.2 | 59.3 | 53.8 | 48.2 | 44.1 | 37.2 | 33.1 | 31.7 | 30.3 |
| 37.5° | 624.4 | 392.9 | 73.1 | 55.1 | 49.6 | 44.1 | 38.6 | 31.7 | 27.6 | 26.2 | 26.2 |
| 40° | 646.5 | 384.6 | 62.0 | 49.6 | 44.1 | 38.6 | 33.1 | 26.2 | 23.4 | 20.7 | 20.7 |
| 42.5° | 692.0 | 387.4 | 55.1 | 46.9 | 40.0 | 34.5 | 27.6 | 22.1 | 19.3 | 17.9 | 17.9 |
| 45° | 758.2 | 395.6 | 51.0 | 42.7 | 35.8 | 28.9 | 23.4 | 19.3 | 15.2 | 13.8 | 13.8 |
| 47.5° | 850.5 | 421.8 | 45.5 | 38.6 | 31.7 | 24.8 | 19.3 | 15.2 | 12.4 | 11.0 | 11.0 |
| 50° | 960.8 | 467.3 | 42.7 | 34.5 | 28.9 | 20.7 | 15.2 | 11.0 | 8.3 | 8.3 | 8.3 |
| 52.5° | 1090.4 | 512.8 | 38.6 | 31.7 | 24.8 | 17.9 | 12.4 | 8.3 | 6.9 | 5.5 | 5.5 |
| 55° | 1199.3 | 552.8 | 34.5 | 28.9 | 20.7 | 13.8 | 9.6 | 6.9 | 5.5 | 4.1 | 4.1 |
| 57.5° | 1341.3 | 610.7 | 28.9 | 24.8 | 16.5 | 11.0 | 6.9 | 5.5 | 2.8 | 2.8 | 2.8 |
| 60° | 1531.5 | 679.6 | 24.8 | 20.7 | 12.4 | 8.3 | 5.5 | 2.8 | 2.8 | 1.4 | 1.4 |
| 62.5° | 1612.8 | 624.4 | 22.1 | 16.5 | 9.6 | 5.5 | 4.1 | 2.8 | 1.4 | 1.4 | 1.4 |
| 65° | 1523.2 | 510.0 | 17.9 | 12.4 | 6.9 | 4.1 | 2.8 | 1.4 | 1.4 | 0.0 | 0.0 |
| 67.5° | 1313.7 | 376.3 | 15.2 | 8.3 | 5.5 | 2.8 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 70° | 1071.1 | 278.5 | 11.0 | 5.5 | 2.8 | 2.8 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 72.5° | 741.6 | 168.2 | 8.3 | 4.1 | 2.8 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 75° | 288.1 | 66.2 | 6.9 | 4.1 | 2.8 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 77.5° | 81.3 | 23.4 | 5.5 | 2.8 | 2.8 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 |
| 80° | 33.1 | 12.4 | 4.1 | 2.8 | 2.8 | 2.8 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 |
| 82.5° | 20.7 | 6.9 | 2.8 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 13.8 | 4.1 | 2.8 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 |
| 87.5° | 2.8 | 2.8 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 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 |

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
 R_f: 69.9
 R_g: 98.3

| | | | |
|-----------|------|------|-------|
| 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 | | |



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 | | | |

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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 | | | |

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 | | | |

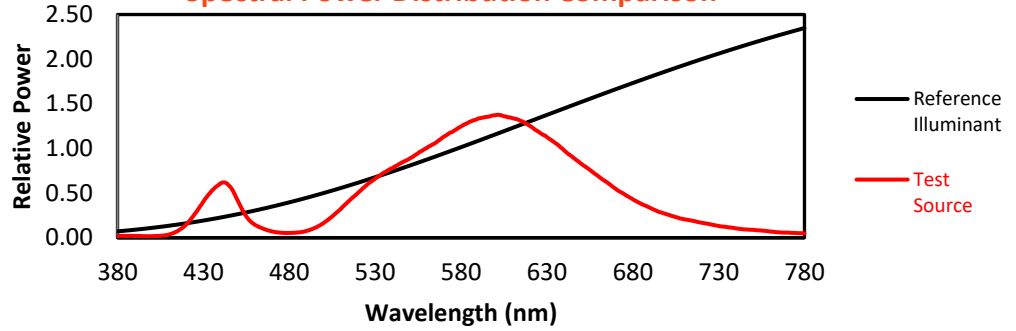
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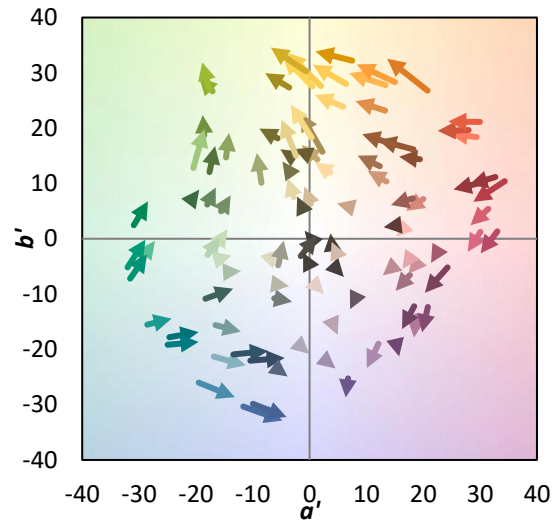
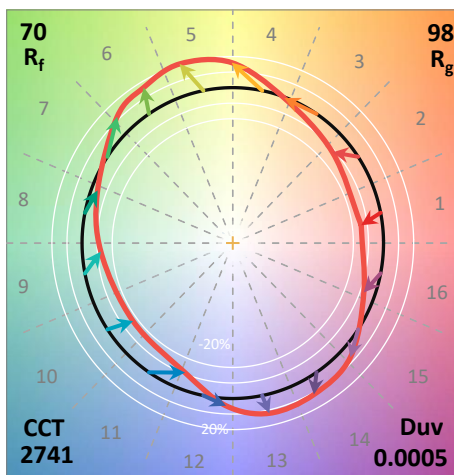
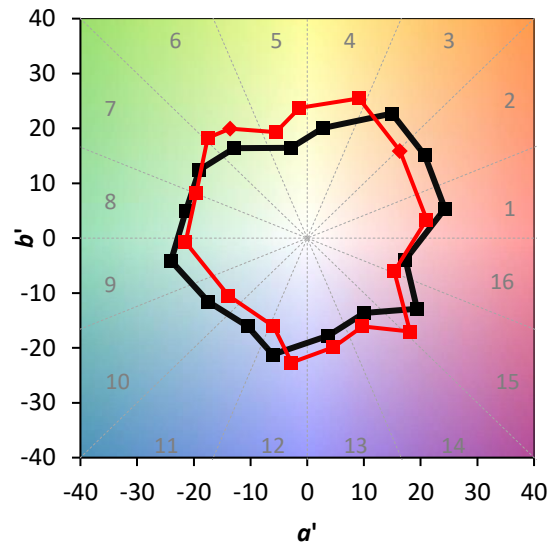
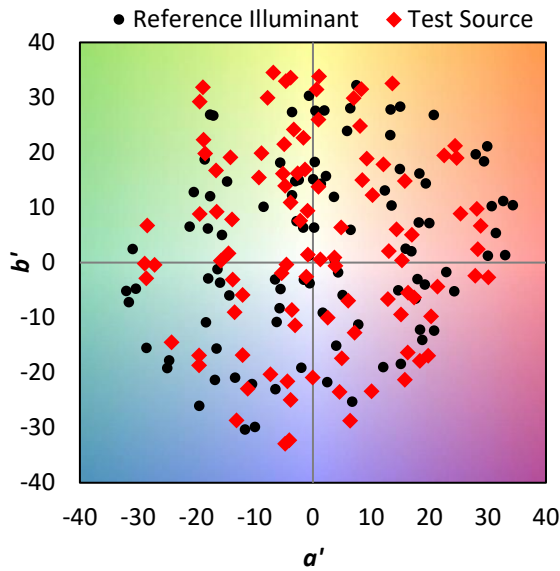
Summary

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

Spectral Power Distribution Comparison



Color Vector Graphics



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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)