

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: P437680

Luminaire Tested: ISC-SA1E-735-U-T4FT-HSS

Issue Date: 12/9/2020

Test Information

Test Method: LM-79-2019
Report Number: P437680
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-11)
Test Lab: INNOVATION CENTER
Issue Date: 12/9/2020
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: MCGRAW-EDISON
Catalog Number: ISC-SA1E-735-U-T4FT-HSS
Description: IMPACT ELITE LED CYLINDER LUMINAIRE
(1) 70 CRI, 3500K, 1050mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV FORWARD THROW OPT
HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 4788.0 lumens
Efficiency: N/A
Efficacy: 82.3 lumens/watt
Spacing Criteria (0/90/45): 0.36 / 2.55 / 2.22
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')
CIE Type: Direct

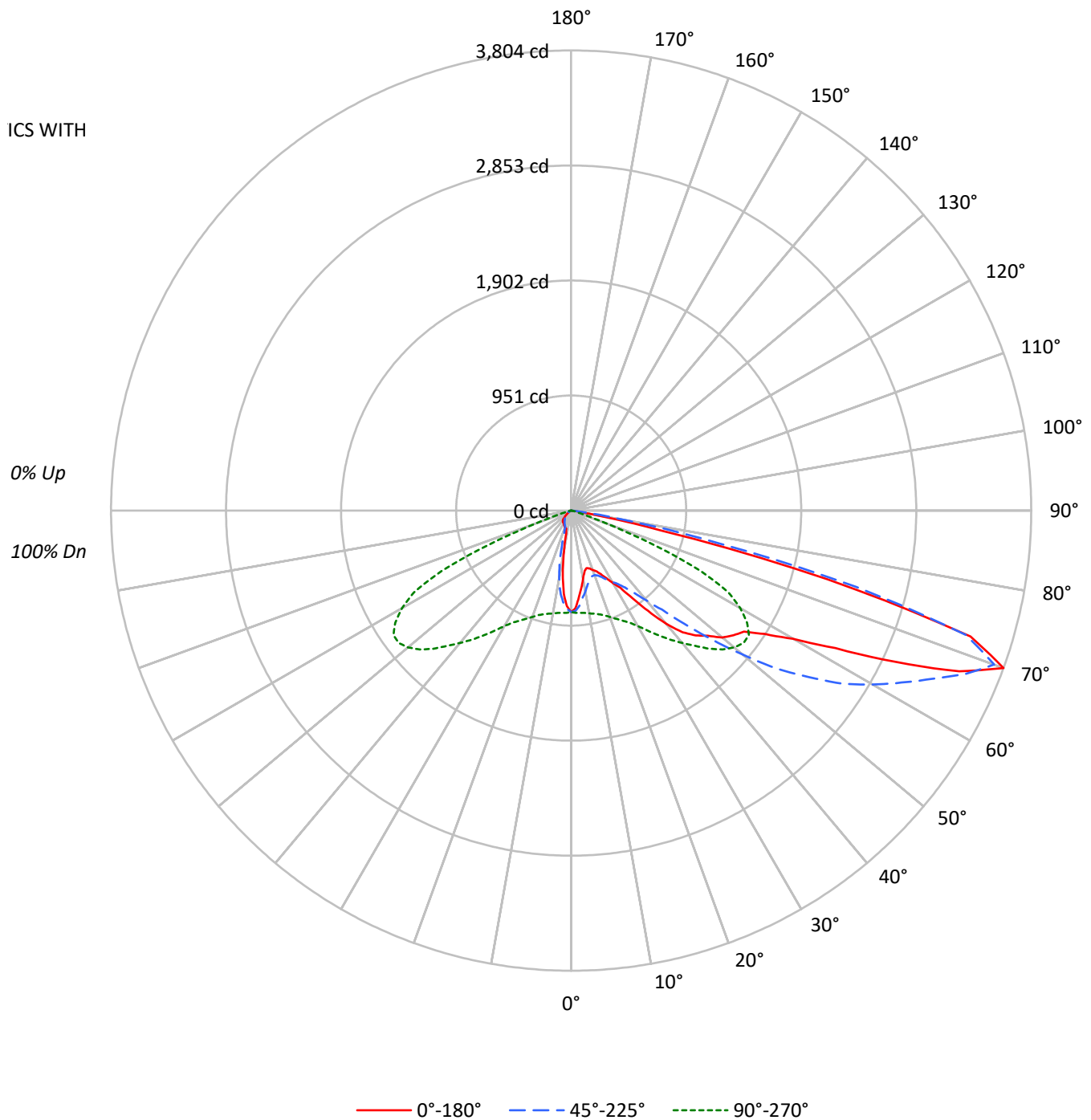
Input Watts (W): 58.2
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT



TEST NUMBER: P437680

CATALOG NUMBER: ISC-SA1E-735-U-T4FT-HSS

Luminous Intensity Polar Plot





TEST NUMBER: P437680

CATALOG NUMBER: ISC-SA1E-735-U-T4FT-HSS

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|-----|---|--|---|
| RF | 20 | | | | | 20 | | | | | 20 | | | | | 20 | | | | | 20 | | | | | |
| RC | 80 | | | | | 70 | | | | | 50 | | | | | 30 | | | | | 10 | | | | | 0 |
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 | | |
| RCR | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 | | | | | 100 | | | |
| 1 | 105 | 99 | 93 | 88 | 102 | 96 | 91 | 86 | 92 | 87 | 83 | 88 | 84 | 81 | 84 | 81 | 78 | 76 | | | | | 76 | | | |
| 2 | 91 | 80 | 71 | 64 | 88 | 78 | 70 | 63 | 75 | 67 | 61 | 71 | 65 | 60 | 68 | 63 | 58 | 56 | | | | | 56 | | | |
| 3 | 80 | 67 | 56 | 47 | 78 | 65 | 55 | 47 | 62 | 53 | 46 | 59 | 51 | 45 | 56 | 50 | 44 | 41 | | | | | 41 | | | |
| 4 | 72 | 56 | 45 | 37 | 69 | 55 | 44 | 36 | 52 | 43 | 36 | 50 | 42 | 35 | 47 | 40 | 34 | 32 | | | | | 32 | | | |
| 5 | 65 | 49 | 37 | 29 | 62 | 47 | 37 | 29 | 45 | 36 | 28 | 43 | 35 | 28 | 41 | 33 | 28 | 25 | | | | | 25 | | | |
| 6 | 59 | 43 | 32 | 24 | 57 | 41 | 31 | 24 | 39 | 30 | 23 | 38 | 29 | 23 | 36 | 28 | 23 | 20 | | | | | 20 | | | |
| 7 | 54 | 38 | 27 | 20 | 52 | 37 | 27 | 20 | 35 | 26 | 20 | 33 | 25 | 19 | 32 | 25 | 19 | 17 | | | | | 17 | | | |
| 8 | 50 | 34 | 24 | 17 | 48 | 33 | 24 | 17 | 32 | 23 | 17 | 30 | 22 | 17 | 29 | 22 | 16 | 14 | | | | | 14 | | | |
| 9 | 46 | 31 | 21 | 15 | 45 | 30 | 21 | 15 | 29 | 20 | 14 | 28 | 20 | 14 | 26 | 19 | 14 | 12 | | | | | 12 | | | |
| 10 | 43 | 28 | 19 | 13 | 42 | 27 | 19 | 13 | 26 | 18 | 13 | 25 | 18 | 13 | 24 | 17 | 13 | 11 | | | | | 11 | | | |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° | 135° | 180° |
|-----|--------|--------|--------|-------|-------|
| 0° | 36119 | 36119 | 36119 | 36119 | 36119 |
| 5° | 31227 | 34053 | 36677 | 32800 | 29865 |
| 10° | 24802 | 29572 | 37735 | 24907 | 14629 |
| 15° | 21940 | 26370 | 39555 | 13078 | 6918 |
| 20° | 23885 | 25993 | 42877 | 6552 | 6777 |
| 25° | 27525 | 28908 | 47682 | 5991 | 6333 |
| 30° | 34354 | 33747 | 54723 | 5424 | 6145 |
| 35° | 46511 | 40777 | 66138 | 4841 | 6118 |
| 40° | 68542 | 54508 | 80261 | 4496 | 5997 |
| 45° | 88869 | 80454 | 98319 | 4281 | 4725 |
| 50° | 109296 | 123911 | 117903 | 4220 | 3249 |
| 55° | 130854 | 179991 | 134675 | 3821 | 2184 |
| 60° | 182470 | 247604 | 139044 | 2713 | 1042 |
| 65° | 301835 | 335180 | 120787 | 1976 | 245 |
| 70° | 478872 | 468486 | 36318 | 1221 | 0 |
| 75° | 364599 | 405738 | 7253 | 799 | 0 |
| 80° | 37862 | 112419 | 3595 | 595 | 0 |
| 85° | 0 | 4792 | 2371 | 0 | 0 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 32°
 Vertical Angle: 72.5°
 Luminance: 722740 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 69.6 | 1.5 |
| 10°-20° | 151.3 | 3.2 |
| 20°-30° | 228.9 | 4.8 |
| 30°-40° | 369.1 | 7.7 |
| 40°-50° | 653.6 | 13.7 |
| 50°-60° | 1001.2 | 20.9 |
| 60°-70° | 1339.4 | 28.0 |
| 70°-80° | 924.7 | 19.3 |
| 80°-90° | 50.1 | 1.0 |
| 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°-30° | 449.9 | 9.4 |
| 0°-40° | 819.0 | 17.1 |
| 0°-60° | 2473.8 | 51.7 |
| 0°-90° | 4788.0 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 4788.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 45° | 90° | 135° | 180° | Flux |
|-----|------|------|------|------|------|------|
| 0° | 839 | 839 | 839 | 839 | 839 | |
| 5° | 722 | 788 | 849 | 759 | 691 | 64 |
| 15° | 492 | 592 | 887 | 293 | 155 | 145 |
| 25° | 579 | 608 | 1004 | 126 | 133 | 275 |
| 35° | 885 | 776 | 1258 | 92 | 116 | 579 |
| 45° | 1460 | 1321 | 1615 | 70 | 78 | 1124 |
| 55° | 1743 | 2398 | 1794 | 51 | 29 | 1621 |
| 65° | 2963 | 3290 | 1186 | 19 | 2 | 2954 |
| 75° | 2192 | 2439 | 44 | 5 | 0 | 2204 |
| 85° | 0 | 10 | 5 | 0 | 0 | 23 |
| 90° | 0 | 0 | 0 | 0 | 0 | |



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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 32° | 35° | 45° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 |
| 2.5° | 807.3 | 807.3 | 809.8 | 812.2 | 812.2 | 819.5 | 829.2 | 831.6 | 838.9 | 843.7 | 846.1 |
| 5° | 722.5 | 732.2 | 732.2 | 744.3 | 754.0 | 763.7 | 787.9 | 802.5 | 826.7 | 843.7 | 848.6 |
| 7.5° | 644.9 | 647.3 | 654.6 | 669.2 | 688.5 | 695.8 | 727.3 | 768.6 | 814.6 | 843.7 | 855.8 |
| 10° | 567.3 | 569.7 | 574.6 | 596.4 | 615.8 | 632.8 | 676.4 | 727.3 | 792.8 | 843.7 | 865.5 |
| 12.5° | 511.6 | 511.6 | 516.4 | 540.7 | 562.5 | 579.4 | 627.9 | 693.4 | 771.0 | 846.1 | 880.1 |
| 15° | 492.2 | 492.2 | 489.7 | 501.9 | 521.3 | 535.8 | 591.6 | 664.3 | 751.6 | 851.0 | 894.6 |
| 17.5° | 501.9 | 501.9 | 492.2 | 494.6 | 511.6 | 521.3 | 569.7 | 642.5 | 741.9 | 860.7 | 918.9 |
| 20° | 521.3 | 521.3 | 501.9 | 501.9 | 518.8 | 526.1 | 567.3 | 630.4 | 737.0 | 877.7 | 952.8 |
| 22.5° | 543.1 | 545.5 | 518.8 | 518.8 | 535.8 | 543.1 | 581.9 | 637.6 | 744.3 | 899.5 | 986.8 |
| 25° | 579.4 | 579.4 | 545.5 | 545.5 | 560.1 | 572.2 | 608.5 | 659.5 | 754.0 | 926.1 | 1040.1 |
| 27.5° | 630.4 | 627.9 | 584.3 | 572.2 | 594.0 | 603.7 | 644.9 | 686.1 | 763.7 | 957.7 | 1088.6 |
| 30° | 691.0 | 678.8 | 635.2 | 611.0 | 630.4 | 637.6 | 678.8 | 722.5 | 792.8 | 1003.7 | 1163.7 |
| 32.5° | 756.4 | 761.3 | 691.0 | 647.3 | 657.0 | 666.7 | 720.1 | 778.3 | 841.3 | 1064.3 | 1265.6 |
| 35° | 884.9 | 884.9 | 812.2 | 729.8 | 712.8 | 717.6 | 775.8 | 851.0 | 901.9 | 1166.2 | 1381.9 |
| 37.5° | 1044.9 | 1049.8 | 981.9 | 894.6 | 841.3 | 819.5 | 860.7 | 938.3 | 989.2 | 1294.7 | 1510.4 |
| 40° | 1219.5 | 1212.2 | 1141.9 | 1061.9 | 1018.3 | 991.6 | 969.8 | 1061.9 | 1108.0 | 1432.9 | 1638.9 |
| 42.5° | 1365.0 | 1350.4 | 1255.9 | 1214.7 | 1188.0 | 1154.0 | 1110.4 | 1217.1 | 1260.7 | 1607.4 | 1786.8 |
| 45° | 1459.5 | 1447.4 | 1352.8 | 1340.7 | 1331.0 | 1311.6 | 1321.3 | 1403.8 | 1445.0 | 1808.6 | 1942.0 |
| 47.5° | 1532.3 | 1515.3 | 1435.3 | 1452.3 | 1471.6 | 1491.0 | 1575.9 | 1636.5 | 1626.8 | 1992.9 | 2068.1 |
| 50° | 1631.7 | 1607.4 | 1532.3 | 1566.2 | 1617.1 | 1655.9 | 1849.9 | 1866.8 | 1791.7 | 2150.5 | 2182.0 |
| 52.5° | 1692.3 | 1663.2 | 1643.8 | 1699.5 | 1774.7 | 1823.2 | 2150.5 | 2085.0 | 1922.6 | 2264.4 | 2271.7 |
| 55° | 1743.2 | 1740.8 | 1774.7 | 1847.4 | 1956.5 | 2017.2 | 2397.8 | 2271.7 | 2007.5 | 2380.8 | 2320.2 |
| 57.5° | 1898.4 | 1888.7 | 1946.8 | 2005.0 | 2186.9 | 2288.7 | 2664.5 | 2407.5 | 2068.1 | 2443.9 | 2293.5 |
| 60° | 2119.0 | 2123.8 | 2126.3 | 2232.9 | 2465.7 | 2606.3 | 2875.4 | 2521.4 | 2114.1 | 2453.6 | 2216.0 |
| 62.5° | 2463.3 | 2497.2 | 2439.0 | 2521.4 | 2802.7 | 2979.7 | 3079.1 | 2603.9 | 2099.6 | 2383.2 | 2019.6 |
| 65° | 2962.7 | 2950.6 | 2868.1 | 2960.3 | 3336.1 | 3445.2 | 3290.0 | 2628.1 | 2014.7 | 2140.8 | 1651.1 |
| 67.5° | 3471.8 | 3476.7 | 3437.9 | 3583.4 | 3949.4 | 3930.1 | 3527.6 | 2545.7 | 1796.5 | 1617.1 | 1035.2 |
| 70° | 3804.0 | 3811.3 | 3908.2 | 4301.0 | 4698.6 | 4565.3 | 3721.5 | 2254.7 | 1265.6 | 771.0 | 392.8 |
| 72.5° | 3462.1 | 3464.6 | 3925.2 | 4638.0 | 5047.7 | 4902.3 | 3420.9 | 1532.3 | 577.0 | 274.0 | 138.2 |
| 75° | 2191.7 | 2082.6 | 2916.6 | 3932.5 | 4322.8 | 4179.8 | 2439.0 | 715.2 | 254.6 | 138.2 | 58.2 |
| 77.5° | 763.7 | 775.8 | 1188.0 | 2264.4 | 2761.5 | 2819.6 | 1253.4 | 235.2 | 140.6 | 94.6 | 31.5 |
| 80° | 152.7 | 172.1 | 351.5 | 834.0 | 1309.2 | 1360.1 | 453.4 | 113.9 | 92.1 | 72.7 | 17.0 |
| 82.5° | 9.7 | 12.1 | 104.3 | 346.7 | 535.8 | 509.1 | 89.7 | 58.2 | 63.0 | 50.9 | 9.7 |
| 85° | 0.0 | 0.0 | 7.3 | 58.2 | 97.0 | 72.7 | 9.7 | 14.5 | 26.7 | 29.1 | 4.8 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.4 | 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 |



TEST NUMBER: P437680

CATALOG NUMBER: ISC-SA1E-735-U-T4FT-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 | 838.9 |
| 2.5° | 846.1 | 846.1 | 834.0 | 829.2 | 821.9 | 812.2 | 802.5 | 797.6 | 787.9 | 790.4 | 790.4 |
| 5° | 848.6 | 843.7 | 829.2 | 807.3 | 783.1 | 758.9 | 729.8 | 710.4 | 688.5 | 693.4 | 691.0 |
| 7.5° | 853.4 | 851.0 | 817.0 | 778.3 | 734.6 | 681.3 | 630.4 | 586.7 | 547.9 | 538.2 | 531.0 |
| 10° | 863.1 | 855.8 | 807.3 | 744.3 | 657.0 | 569.7 | 482.5 | 407.3 | 375.8 | 341.8 | 334.6 |
| 12.5° | 872.8 | 860.7 | 790.4 | 695.8 | 562.5 | 434.0 | 320.0 | 252.1 | 210.9 | 198.8 | 194.0 |
| 15° | 887.4 | 868.0 | 768.6 | 627.9 | 450.9 | 293.4 | 201.2 | 164.9 | 157.6 | 155.2 | 155.2 |
| 17.5° | 906.7 | 872.8 | 746.7 | 550.4 | 332.2 | 189.1 | 147.9 | 147.9 | 150.3 | 152.7 | 152.7 |
| 20° | 935.8 | 884.9 | 715.2 | 455.8 | 223.1 | 143.0 | 140.6 | 143.0 | 145.5 | 147.9 | 147.9 |
| 22.5° | 967.4 | 904.3 | 678.8 | 356.4 | 157.6 | 133.3 | 133.3 | 135.8 | 138.2 | 140.6 | 140.6 |
| 25° | 1003.7 | 918.9 | 630.4 | 254.6 | 130.9 | 126.1 | 126.1 | 128.5 | 130.9 | 133.3 | 133.3 |
| 27.5° | 1042.5 | 935.8 | 564.9 | 174.6 | 118.8 | 118.8 | 121.2 | 123.6 | 126.1 | 126.1 | 128.5 |
| 30° | 1100.7 | 962.5 | 497.0 | 128.5 | 109.1 | 109.1 | 113.9 | 118.8 | 121.2 | 121.2 | 123.6 |
| 32.5° | 1175.9 | 984.3 | 404.9 | 109.1 | 101.8 | 99.4 | 104.3 | 111.5 | 116.4 | 118.8 | 118.8 |
| 35° | 1258.3 | 1015.8 | 303.1 | 99.4 | 94.6 | 92.1 | 94.6 | 101.8 | 111.5 | 116.4 | 116.4 |
| 37.5° | 1343.2 | 1044.9 | 225.5 | 94.6 | 87.3 | 84.9 | 87.3 | 92.1 | 101.8 | 111.5 | 113.9 |
| 40° | 1428.0 | 1049.8 | 162.4 | 87.3 | 82.4 | 80.0 | 80.0 | 84.9 | 94.6 | 104.3 | 106.7 |
| 42.5° | 1515.3 | 1069.2 | 123.6 | 82.4 | 75.2 | 75.2 | 75.2 | 77.6 | 84.9 | 92.1 | 94.6 |
| 45° | 1614.7 | 1081.3 | 99.4 | 75.2 | 70.3 | 70.3 | 70.3 | 70.3 | 75.2 | 77.6 | 77.6 |
| 47.5° | 1699.5 | 1064.3 | 80.0 | 67.9 | 65.5 | 65.5 | 65.5 | 63.0 | 63.0 | 60.6 | 60.6 |
| 50° | 1760.2 | 1025.5 | 65.5 | 60.6 | 60.6 | 63.0 | 58.2 | 53.3 | 53.3 | 48.5 | 48.5 |
| 52.5° | 1796.5 | 967.4 | 55.8 | 53.3 | 58.2 | 58.2 | 50.9 | 48.5 | 43.6 | 38.8 | 36.4 |
| 55° | 1794.1 | 870.4 | 48.5 | 46.1 | 50.9 | 50.9 | 43.6 | 38.8 | 33.9 | 29.1 | 29.1 |
| 57.5° | 1723.8 | 763.7 | 43.6 | 38.8 | 43.6 | 41.2 | 36.4 | 29.1 | 24.2 | 19.4 | 19.4 |
| 60° | 1614.7 | 649.8 | 38.8 | 31.5 | 33.9 | 31.5 | 29.1 | 21.8 | 17.0 | 12.1 | 12.1 |
| 62.5° | 1466.8 | 543.1 | 31.5 | 26.7 | 24.2 | 24.2 | 21.8 | 17.0 | 9.7 | 7.3 | 7.3 |
| 65° | 1185.6 | 402.5 | 24.2 | 19.4 | 17.0 | 19.4 | 14.5 | 9.7 | 4.8 | 2.4 | 2.4 |
| 67.5° | 732.2 | 230.3 | 19.4 | 14.5 | 12.1 | 14.5 | 9.7 | 7.3 | 2.4 | 0.0 | 0.0 |
| 70° | 288.5 | 99.4 | 14.5 | 9.7 | 9.7 | 9.7 | 7.3 | 4.8 | 0.0 | 0.0 | 0.0 |
| 72.5° | 99.4 | 43.6 | 12.1 | 7.3 | 7.3 | 4.8 | 4.8 | 2.4 | 0.0 | 0.0 | 0.0 |
| 75° | 43.6 | 26.7 | 9.7 | 7.3 | 4.8 | 4.8 | 2.4 | 2.4 | 0.0 | 0.0 | 0.0 |
| 77.5° | 24.2 | 17.0 | 7.3 | 4.8 | 4.8 | 2.4 | 2.4 | 2.4 | 0.0 | 0.0 | 0.0 |
| 80° | 14.5 | 9.7 | 4.8 | 4.8 | 4.8 | 2.4 | 2.4 | 2.4 | 0.0 | 0.0 | 0.0 |
| 82.5° | 9.7 | 4.8 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 0.0 | 0.0 | 0.0 |
| 85° | 4.8 | 2.4 | 0.0 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 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 |

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



Test Information

Test Method: LM-79-08
 Report Number: SP1-2101-121-7
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1
 Measurement Geometry: 4π
 Issue Date: 03/04/2021
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: STREETWORKS
 Catalog Number: **IFLD-S-SA2A-735-U-T2**
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

Spectral Parameters

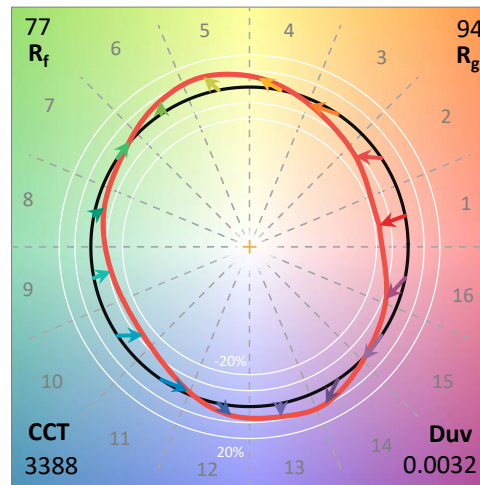
CCT (K): 3388
 CIE u': 0.2371
 CIE v': 0.5177
 Duv: 0.0032
 CIE x: 0.4153
 CIE y: 0.4030
 CIE z: 0.1817
 Peak Wavelength (nm): 590
 Dominant Wavelength (nm): 580
 Purity: 45.7

 Rf: 76.9
 Rg: 94.4

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 73.1 | | |
| R1: | 68.9 | R9: | -34.6 |
| R2: | 81.1 | R10: | 57.8 |
| R3: | 93.1 | R11: | 68.6 |
| R4: | 71.6 | R12: | 53.9 |
| R5: | 69.4 | R13: | 70.9 |
| R6: | 75.0 | R14: | 96.2 |
| R7: | 79.5 | | |
| R8: | 46.4 | | |

Test Conditions

Stabilization Time: 81M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.0/30%
 Sphere Temperature (°C): 24.1



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| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 1/31/2021 | 7/31/2021 |
| Power Meter | IN0071 | 12/1/2020 | 12/1/2021 |
| AC Power Source | IN0063 | 12/1/2020 | 12/1/2021 |
| DC Power Source | IN0208 | 12/1/2020 | 12/1/2021 |
| Sphere Thermometer | IN0085 | 12/1/2020 | 12/1/2021 |
| Room Thermometer | IN0046 | 12/1/2020 | 12/1/2021 |

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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 3500K 4-step quadrangle

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Photopic Flux vs. Wavelength



#####

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360 | 2672 | 0.0 | 490 | 34553 | 4.9 | 620 | 136720 | 35.6 | 750 | 5870 | 0.0 | 880 | 4216 | 0.0 |
| 365 | 2252 | 0.0 | 495 | 44336 | 8.0 | 625 | 126308 | 27.9 | 755 | 5421 | 0.0 | 885 | 4132 | 0.0 |
| 370 | 2217 | 0.0 | 500 | 54643 | 12.1 | 630 | 114625 | 20.7 | 760 | 5097 | 0.0 | 890 | 3992 | 0.0 |
| 375 | 2697 | 0.0 | 505 | 64676 | 18.1 | 635 | 103216 | 15.5 | 765 | 4626 | 0.0 | 895 | 3214 | 0.0 |
| 380 | 3039 | 0.0 | 510 | 73825 | 25.4 | 640 | 92605 | 11.1 | 770 | 3782 | 0.0 | 900 | 2580 | 0.0 |
| 385 | 2655 | 0.0 | 515 | 81872 | 33.9 | 645 | 83234 | 8.0 | 775 | 3506 | 0.0 | 905 | 1776 | 0.0 |
| 390 | 2357 | 0.0 | 520 | 88574 | 43.0 | 650 | 73263 | 5.4 | 780 | 3507 | 0.0 | 910 | 3995 | 0.0 |
| 395 | 2186 | 0.0 | 525 | 93289 | 50.1 | 655 | 64627 | 3.7 | 785 | 3267 | 0.0 | 915 | 4288 | 0.0 |
| 400 | 2015 | 0.0 | 530 | 98393 | 57.9 | 660 | 56614 | 2.4 | 790 | 2849 | 0.0 | 920 | 2446 | 0.0 |
| 405 | 2234 | 0.0 | 535 | 103269 | 64.0 | 665 | 49537 | 1.6 | 795 | 3037 | 0.0 | 925 | 3009 | 0.0 |
| 410 | 3412 | 0.0 | 540 | 107316 | 69.9 | 670 | 42866 | 0.9 | 800 | 2716 | 0.0 | 930 | 3026 | 0.0 |
| 415 | 6135 | 0.0 | 545 | 113101 | 75.3 | 675 | 36708 | 0.6 | 805 | 2648 | 0.0 | 935 | 4734 | 0.0 |
| 420 | 12146 | 0.0 | 550 | 120690 | 82.0 | 680 | 31814 | 0.4 | 810 | 3187 | 0.0 | 940 | 3719 | 0.0 |
| 425 | 23983 | 0.1 | 555 | 128583 | 87.8 | 685 | 27485 | 0.2 | 815 | 2931 | 0.0 | 945 | 1480 | 0.0 |
| 430 | 42142 | 0.3 | 560 | 137796 | 93.6 | 690 | 23698 | 0.1 | 820 | 2717 | 0.0 | 950 | 3450 | 0.0 |
| 435 | 68228 | 0.8 | 565 | 146577 | 97.5 | 695 | 20309 | 0.1 | 825 | 2236 | 0.0 | 955 | 5051 | 0.0 |
| 440 | 99323 | 1.6 | 570 | 154581 | 100.5 | 700 | 17890 | 0.1 | 830 | 2628 | 0.0 | 960 | 3176 | 0.0 |
| 445 | 115584 | 2.4 | 575 | 162633 | 101.2 | 705 | 15500 | 0.0 | 835 | 3140 | 0.0 | 965 | 5178 | 0.0 |
| 450 | 94997 | 2.5 | 580 | 168101 | 99.9 | 710 | 13699 | 0.0 | 840 | 3675 | 0.0 | 970 | 6385 | 0.0 |
| 455 | 61433 | 2.1 | 585 | 173145 | 96.2 | 715 | 12398 | 0.0 | 845 | 3283 | 0.0 | 975 | 3810 | 0.0 |
| 460 | 43373 | 1.8 | 590 | 174675 | 90.3 | 720 | 11147 | 0.0 | 850 | 3055 | 0.0 | 980 | 4322 | 0.0 |
| 465 | 32472 | 1.7 | 595 | 173724 | 82.3 | 725 | 9761 | 0.0 | 855 | 2932 | 0.0 | 985 | 4200 | 0.0 |
| 470 | 24257 | 1.5 | 600 | 171241 | 73.8 | 730 | 8651 | 0.0 | 860 | 3382 | 0.0 | 990 | 4661 | 0.0 |
| 475 | 21690 | 1.7 | 605 | 165134 | 64.0 | 735 | 7730 | 0.0 | 865 | 2605 | 0.0 | 995 | 6746 | 0.0 |
| 480 | 23173 | 2.2 | 610 | 156652 | 53.8 | 740 | 6847 | 0.0 | 870 | 3325 | 0.0 | 1000 | 4150 | 0.0 |
| 485 | 27564 | 3.3 | 615 | 147879 | 44.6 | 745 | 6124 | 0.0 | 875 | 3325 | 0.0 | | | |

REPORT NUMBER: SP1-2101-121-7

Scotopic Flux vs. Wavelength



Scotopic Lumens: 12126

S/P: 1.36

| 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 | 2672 | 0.0 | 490 | 34553 | 53.2 | 620 | 136720 | 1.7 | 750 | 5870 | 0.0 | 880 | 4216 | 0.0 |
| 365 | 2252 | 0.0 | 495 | 44336 | 71.7 | 625 | 126308 | 1.1 | 755 | 5421 | 0.0 | 885 | 4132 | 0.0 |
| 370 | 2217 | 0.0 | 500 | 54643 | 91.4 | 630 | 114625 | 0.6 | 760 | 5097 | 0.0 | 890 | 3992 | 0.0 |
| 375 | 2697 | 0.0 | 505 | 64676 | 110.0 | 635 | 103216 | 0.4 | 765 | 4626 | 0.0 | 895 | 3214 | 0.0 |
| 380 | 3039 | 0.0 | 510 | 73825 | 125.1 | 640 | 92605 | 0.2 | 770 | 3782 | 0.0 | 900 | 2580 | 0.0 |
| 385 | 2655 | 0.0 | 515 | 81872 | 135.7 | 645 | 83234 | 0.1 | 775 | 3506 | 0.0 | 905 | 1776 | 0.0 |
| 390 | 2357 | 0.0 | 520 | 88574 | 140.8 | 650 | 73263 | 0.1 | 780 | 3507 | 0.0 | 910 | 3995 | 0.0 |
| 395 | 2186 | 0.0 | 525 | 93289 | 139.6 | 655 | 64627 | 0.1 | 785 | 3267 | 0.0 | 915 | 4288 | 0.0 |
| 400 | 2015 | 0.0 | 530 | 98393 | 135.7 | 660 | 56614 | 0.0 | 790 | 2849 | 0.0 | 920 | 2446 | 0.0 |
| 405 | 2234 | 0.1 | 535 | 103269 | 128.7 | 665 | 49537 | 0.0 | 795 | 3037 | 0.0 | 925 | 3009 | 0.0 |
| 410 | 3412 | 0.2 | 540 | 107316 | 118.6 | 670 | 42866 | 0.0 | 800 | 2716 | 0.0 | 930 | 3026 | 0.0 |
| 415 | 6135 | 0.6 | 545 | 113101 | 108.4 | 675 | 36708 | 0.0 | 805 | 2648 | 0.0 | 935 | 4734 | 0.0 |
| 420 | 12146 | 2.0 | 550 | 120690 | 98.7 | 680 | 31814 | 0.0 | 810 | 3187 | 0.0 | 940 | 3719 | 0.0 |
| 425 | 23983 | 5.9 | 555 | 128583 | 87.9 | 685 | 27485 | 0.0 | 815 | 2931 | 0.0 | 945 | 1480 | 0.0 |
| 430 | 42142 | 14.3 | 560 | 137796 | 77.0 | 690 | 23698 | 0.0 | 820 | 2717 | 0.0 | 950 | 3450 | 0.0 |
| 435 | 68228 | 30.5 | 565 | 146577 | 65.8 | 695 | 20309 | 0.0 | 825 | 2236 | 0.0 | 955 | 5051 | 0.0 |
| 440 | 99323 | 55.5 | 570 | 154581 | 54.6 | 700 | 17890 | 0.0 | 830 | 2628 | 0.0 | 960 | 3176 | 0.0 |
| 445 | 115584 | 77.4 | 575 | 162633 | 44.3 | 705 | 15500 | 0.0 | 835 | 3140 | 0.0 | 965 | 5178 | 0.0 |
| 450 | 94997 | 73.6 | 580 | 168101 | 34.6 | 710 | 13699 | 0.0 | 840 | 3675 | 0.0 | 970 | 6385 | 0.0 |
| 455 | 61433 | 53.7 | 585 | 173145 | 26.5 | 715 | 12398 | 0.0 | 845 | 3283 | 0.0 | 975 | 3810 | 0.0 |
| 460 | 43373 | 41.9 | 590 | 174675 | 19.5 | 720 | 11147 | 0.0 | 850 | 3055 | 0.0 | 980 | 4322 | 0.0 |
| 465 | 32472 | 34.3 | 595 | 173724 | 13.9 | 725 | 9761 | 0.0 | 855 | 2932 | 0.0 | 985 | 4200 | 0.0 |
| 470 | 24257 | 27.9 | 600 | 171241 | 9.7 | 730 | 8651 | 0.0 | 860 | 3382 | 0.0 | 990 | 4661 | 0.0 |
| 475 | 21690 | 27.1 | 605 | 165134 | 6.5 | 735 | 7730 | 0.0 | 865 | 2605 | 0.0 | 995 | 6746 | 0.0 |
| 480 | 23173 | 31.3 | 610 | 156652 | 4.2 | 740 | 6847 | 0.0 | 870 | 3325 | 0.0 | 1000 | 4150 | 0.0 |
| 485 | 27564 | 40.0 | 615 | 147879 | 2.7 | 745 | 6124 | 0.0 | 875 | 3325 | 0.0 | | | |

REPORT NUMBER: SP1-2101-121-7

Melanopic Flux vs. Wavelength



Melanopic Lumens: 4490.7 M/P: 0.5

| 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 | 2672 | 0.0 | 490 | 34553 | 28.8 | 620 | 136720 | 0.1 | 750 | 5870 | 0.0 | 880 | 4216 | 0.0 |
| 365 | 2252 | 0.0 | 495 | 44336 | 36.6 | 625 | 126308 | 0.1 | 755 | 5421 | 0.0 | 885 | 4132 | 0.0 |
| 370 | 2217 | 0.0 | 500 | 54643 | 43.9 | 630 | 114625 | 0.0 | 760 | 5097 | 0.0 | 890 | 3992 | 0.0 |
| 375 | 2697 | 0.0 | 505 | 64676 | 49.6 | 635 | 103216 | 0.0 | 765 | 4626 | 0.0 | 895 | 3214 | 0.0 |
| 380 | 3039 | 0.0 | 510 | 73825 | 53.0 | 640 | 92605 | 0.0 | 770 | 3782 | 0.0 | 900 | 2580 | 0.0 |
| 385 | 2655 | 0.0 | 515 | 81872 | 53.5 | 645 | 83234 | 0.0 | 775 | 3506 | 0.0 | 905 | 1776 | 0.0 |
| 390 | 2357 | 0.0 | 520 | 88574 | 51.6 | 650 | 73263 | 0.0 | 780 | 3507 | 0.0 | 910 | 3995 | 0.0 |
| 395 | 2186 | 0.0 | 525 | 93289 | 47.3 | 655 | 64627 | 0.0 | 785 | 3267 | 0.0 | 915 | 4288 | 0.0 |
| 400 | 2015 | 0.0 | 530 | 98393 | 42.5 | 660 | 56614 | 0.0 | 790 | 2849 | 0.0 | 920 | 2446 | 0.0 |
| 405 | 2234 | 0.0 | 535 | 103269 | 37.2 | 665 | 49537 | 0.0 | 795 | 3037 | 0.0 | 925 | 3009 | 0.0 |
| 410 | 3412 | 0.1 | 540 | 107316 | 31.4 | 670 | 42866 | 0.0 | 800 | 2716 | 0.0 | 930 | 3026 | 0.0 |
| 415 | 6135 | 0.4 | 545 | 113101 | 26.3 | 675 | 36708 | 0.0 | 805 | 2648 | 0.0 | 935 | 4734 | 0.0 |
| 420 | 12146 | 1.4 | 550 | 120690 | 21.7 | 680 | 31814 | 0.0 | 810 | 3187 | 0.0 | 940 | 3719 | 0.0 |
| 425 | 23983 | 3.7 | 555 | 128583 | 17.3 | 685 | 27485 | 0.0 | 815 | 2931 | 0.0 | 945 | 1480 | 0.0 |
| 430 | 42142 | 8.9 | 560 | 137796 | 13.6 | 690 | 23698 | 0.0 | 820 | 2717 | 0.0 | 950 | 3450 | 0.0 |
| 435 | 68228 | 18.2 | 565 | 146577 | 10.3 | 695 | 20309 | 0.0 | 825 | 2236 | 0.0 | 955 | 5051 | 0.0 |
| 440 | 99323 | 33.2 | 570 | 154581 | 7.6 | 700 | 17890 | 0.0 | 830 | 2628 | 0.0 | 960 | 3176 | 0.0 |
| 445 | 115584 | 45.6 | 575 | 162633 | 5.4 | 705 | 15500 | 0.0 | 835 | 3140 | 0.0 | 965 | 5178 | 0.0 |
| 450 | 94997 | 43.8 | 580 | 168101 | 3.8 | 710 | 13699 | 0.0 | 840 | 3675 | 0.0 | 970 | 6385 | 0.0 |
| 455 | 61433 | 32.2 | 585 | 173145 | 2.6 | 715 | 12398 | 0.0 | 845 | 3283 | 0.0 | 975 | 3810 | 0.0 |
| 460 | 43373 | 25.6 | 590 | 174675 | 1.7 | 720 | 11147 | 0.0 | 850 | 3055 | 0.0 | 980 | 4322 | 0.0 |
| 465 | 32472 | 21.2 | 595 | 173724 | 1.1 | 725 | 9761 | 0.0 | 855 | 2932 | 0.0 | 985 | 4200 | 0.0 |
| 470 | 24257 | 17.4 | 600 | 171241 | 0.7 | 730 | 8651 | 0.0 | 860 | 3382 | 0.0 | 990 | 4661 | 0.0 |
| 475 | 21690 | 16.6 | 605 | 165134 | 0.5 | 735 | 7730 | 0.0 | 865 | 2605 | 0.0 | 995 | 6746 | 0.0 |
| 480 | 23173 | 18.6 | 610 | 156652 | 0.3 | 740 | 6847 | 0.0 | 870 | 3325 | 0.0 | 1000 | 4150 | 0.0 |
| 485 | 27564 | 22.7 | 615 | 147879 | 0.2 | 745 | 6124 | 0.0 | 875 | 3325 | 0.0 | | | |

Summary

$R_f = 76.9$
 $R_g = 94.4$
 $CIE R_a = 73.1$
 $R_g = -34.6$



Color Vector Graphics

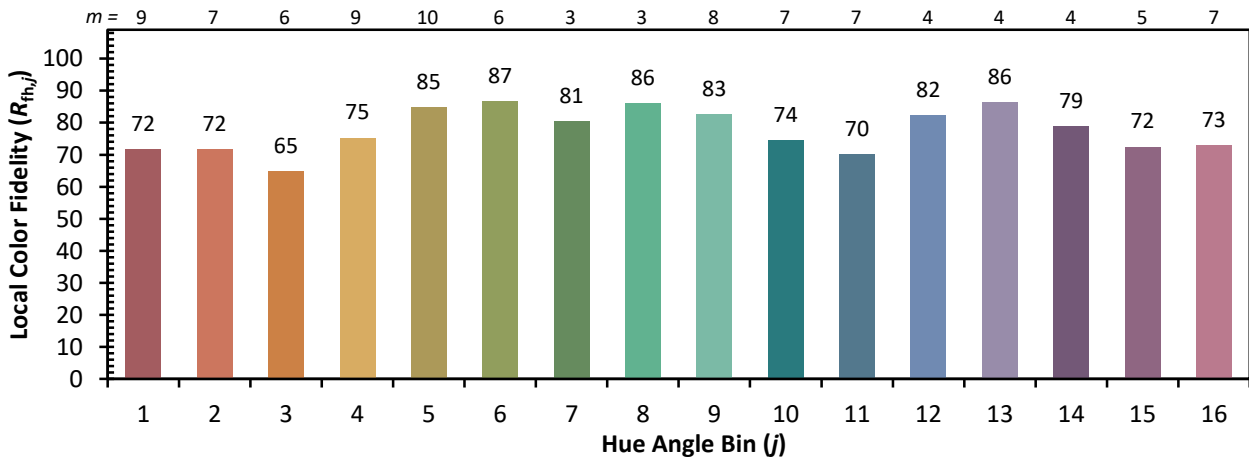


Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 88 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 84 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 75 | CES81 = 75 |
| CES07 = 40 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 39 | CES33 = 74 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 78 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 89 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 68 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 88 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 59 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 88 | CES75 = 66 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)