

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: INVUE

Report Number: P880257

Luminaire Tested: **EMM2-HSN-VA2-730-U-WT4**

Issue Date: 10/01/2024



Test Information

Test Method: LM-79-08
Report Number: P880257
Test Lab: INNOVATION CENTER(G3)
Issue Date: 10/01/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-VA2-730-U-WT4
Description: EPIC MODERN SHORT HOUSING 2W 70CRI 3000K VISUAL COMFORT FIXTURE w/
DRIVE LANE TYPE IV DISTRIBUTION OPTIC
Light Source: (1) 3000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

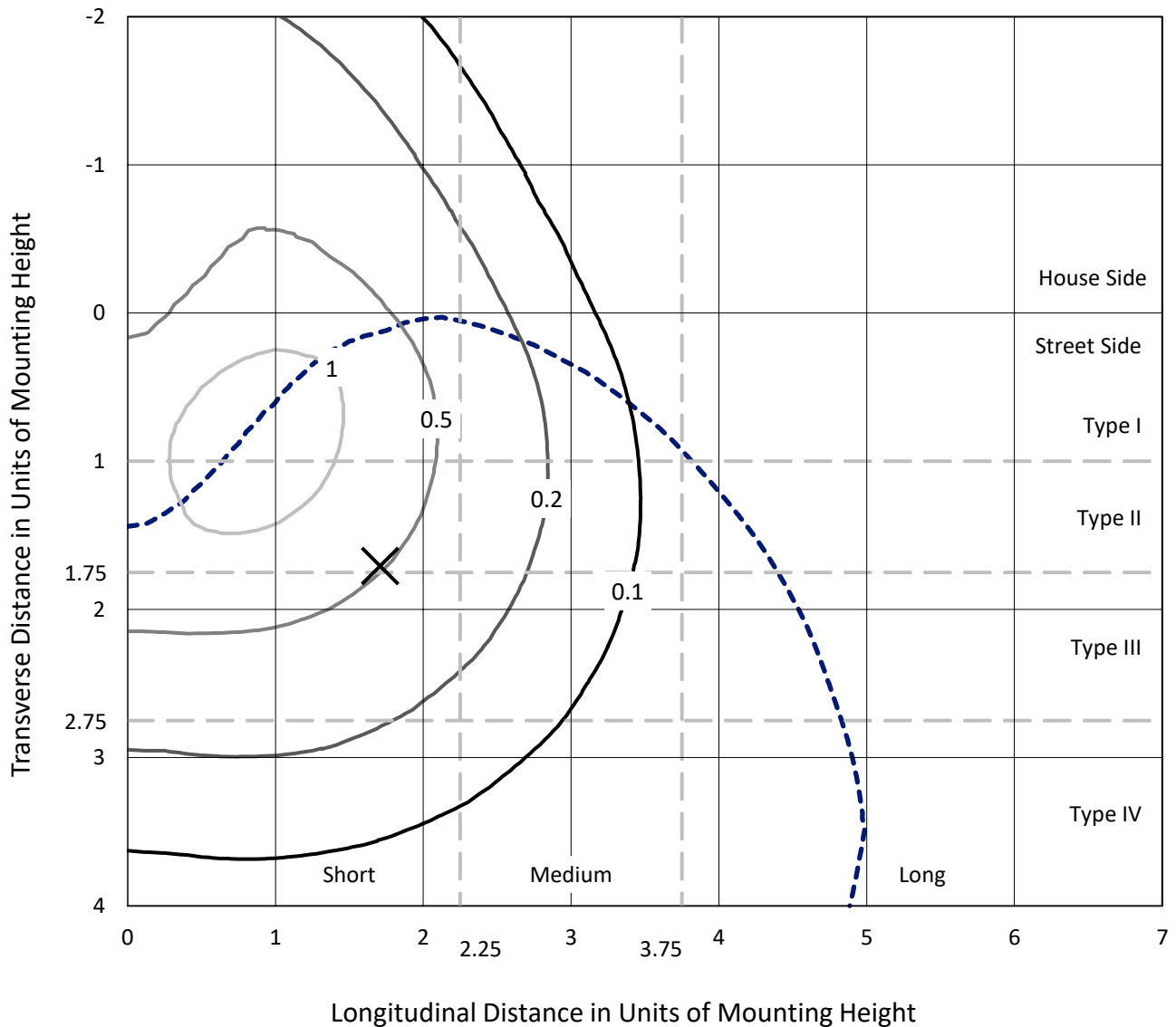
Lumens per Lamp: N/A
Luminaire Lumens: 4024.8 lumens
Efficiency: N/A
Efficacy: 104.3 lumens/watt
Luminous Opening: Circular (Dia: 1.12' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B2 - U0 - G3

Input Watts (W): 38.6
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 7%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

REPORT NUMBER: P880257
 CATALOG NUMBER: EMM2-HSN-VA2-730-U-WT4

Iso-Footcandle Lines of Horizontal Illumination

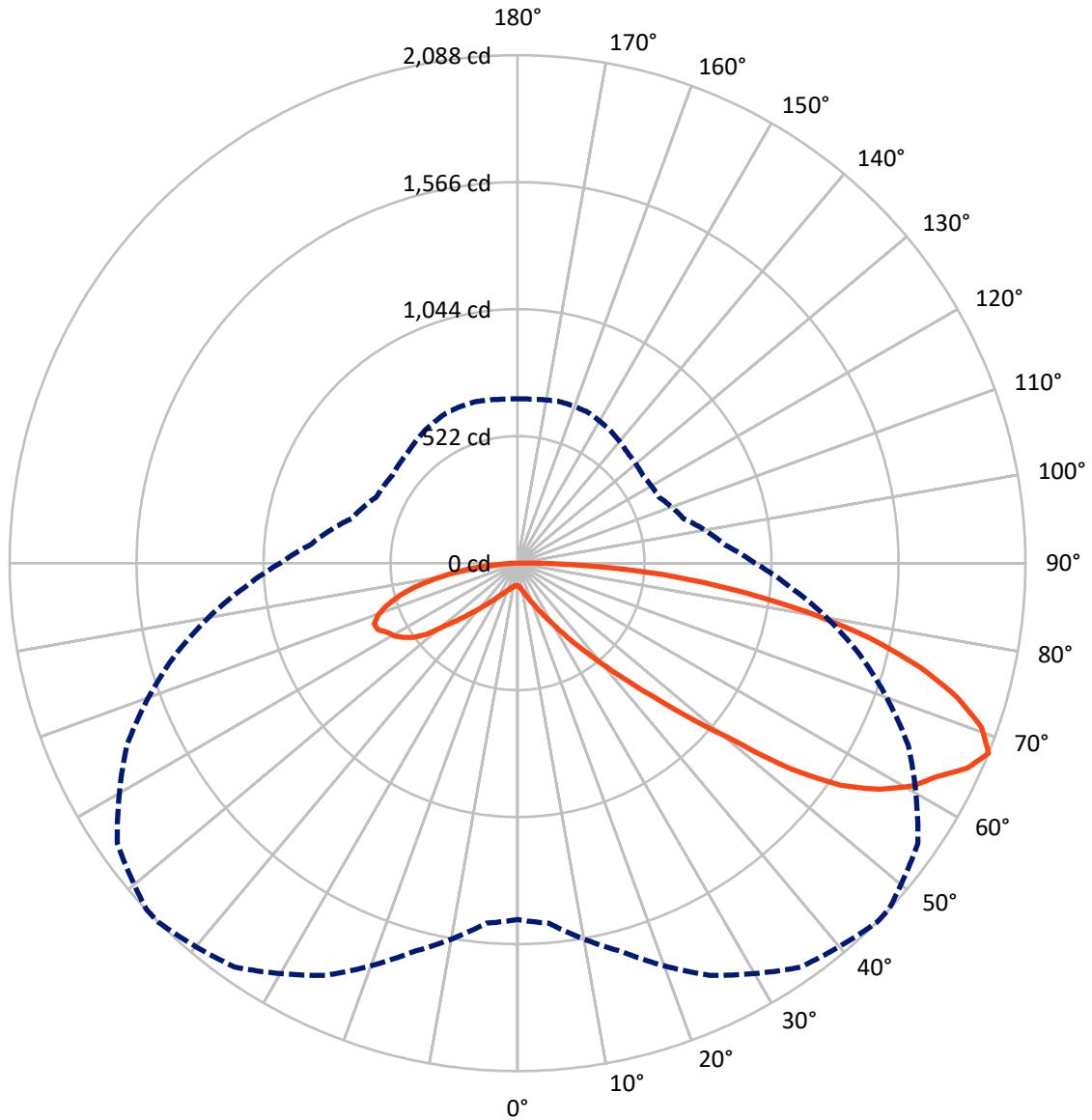
× Max cd
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 1.4 fc
 Type IV - Short - N/A

REPORT NUMBER: P880257
CATALOG NUMBER: EMM2-HSN-VA2-730-U-WT4

Luminous Intensity Polar Plot



— Vertical Plane Through 45-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

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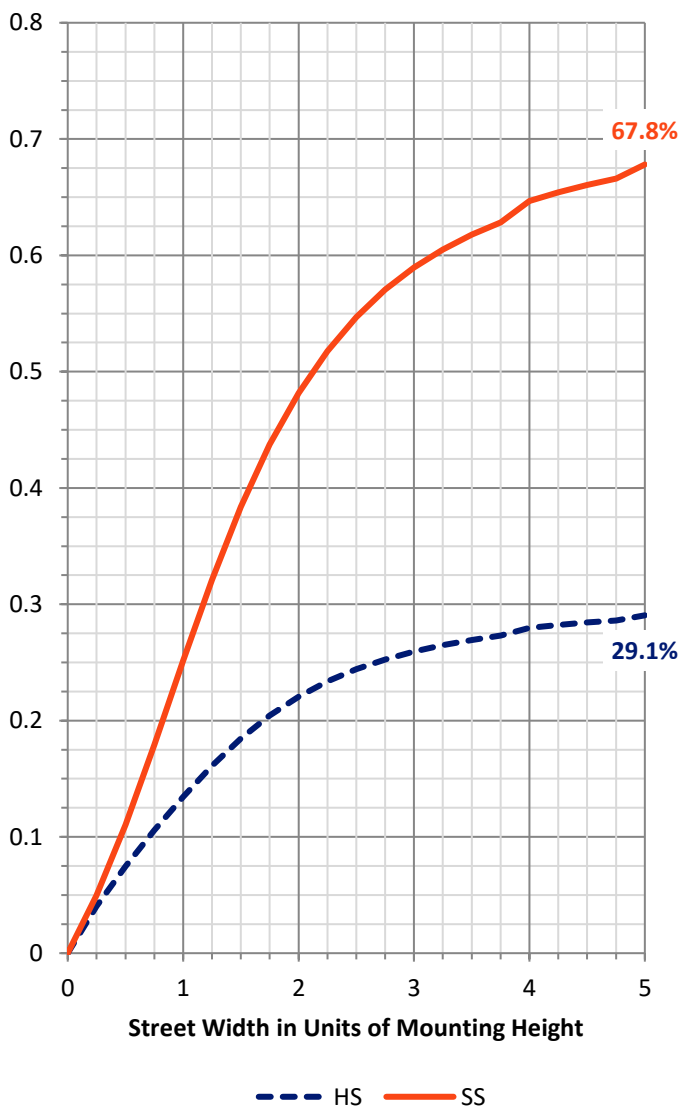
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 1192.8 | 0.0 | 1192.8 |
| | % Fixture | 29.6 | 0.0 | 29.6 |
| Street Side | Lumens | 2832.0 | 0.0 | 2832.0 |
| | % Fixture | 70.4 | 0.0 | 70.4 |
| Total | Lumens | 4024.8 | 0.0 | 4024.8 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

Coefficient of Utilization

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 9.5 | 0.2 |
| 10°-20° | 35.8 | 0.9 |
| 20°-30° | 84.4 | 2.1 |
| 30°-40° | 185.0 | 4.6 |
| 40°-50° | 402.7 | 10.0 |
| 50°-60° | 827.5 | 20.6 |
| 60°-70° | 1165.8 | 29.0 |
| 70°-80° | 989.7 | 24.6 |
| 80°-90° | 324.4 | 8.1 |
| 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° | 4024.8 | 100.0 |
| 0°-180° | 4024.8 | 100.0 |



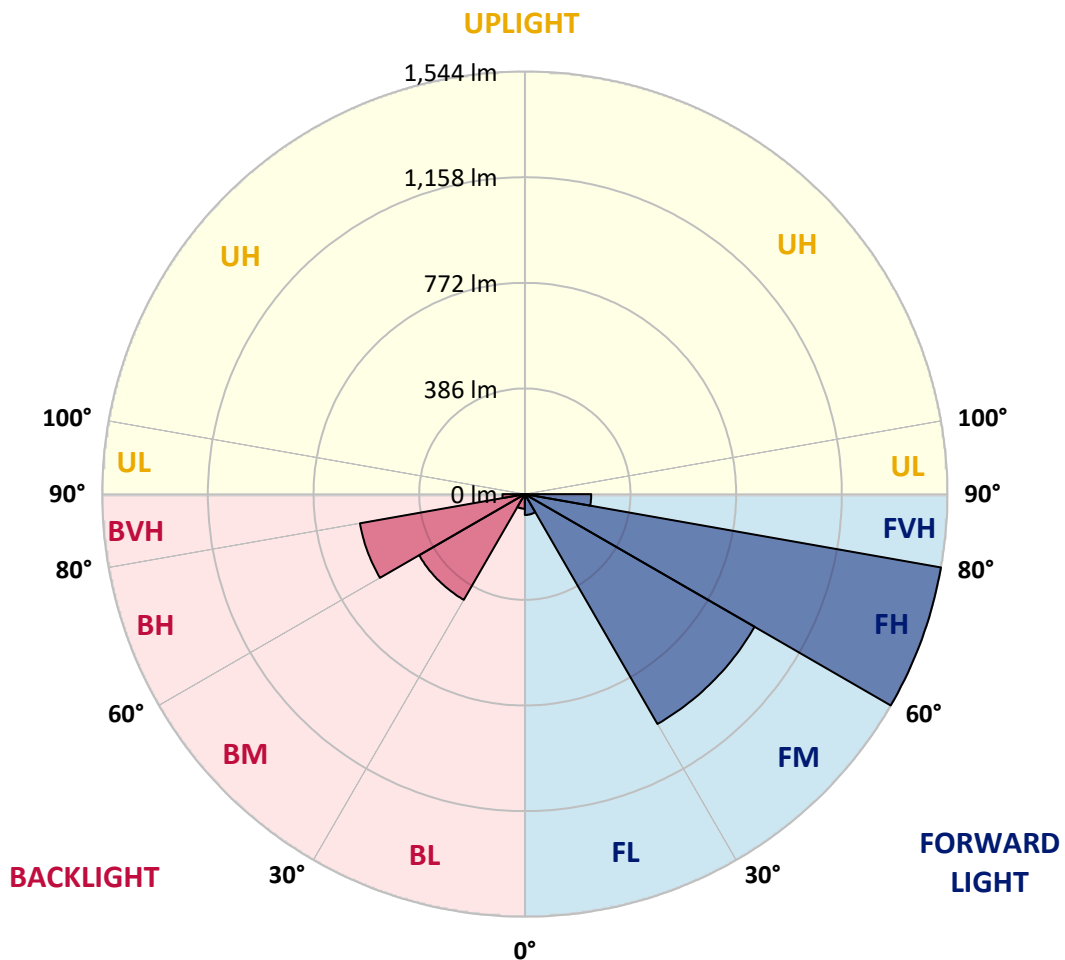
REPORT NUMBER: P880257
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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 76.2 | 1.9 | | | |
| FM (30°-60°) | 969.4 | 24.1 | | | |
| FH (60°-80°) | 1543.9 | 38.4 | | | G1/1800 |
| FVH (80°-90°) | 242.6 | 6.0 | | | G3/500 |
| BL (0°-30°) | 53.5 | 1.3 | B0/110 | | |
| BM (30°-60°) | 445.8 | 11.1 | B1/1000 | | |
| BH (60°-80°) | 611.6 | 15.2 | B2/1000 | | G2/1000 |
| BVH (80°-90°) | 81.8 | 2.0 | | | G1/100 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B2-U0-G3

Type IV Short





REPORT NUMBER: P880257

CATALOG NUMBER: EMM2-HSN-VA2-730-U-WT4

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 47° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 |
| 2.5° | 95.8 | 95.4 | 95.8 | 95.8 | 95.8 | 95.4 | 95.4 | 95.4 | 95.0 | 94.6 | 94.2 |
| 5° | 101.6 | 101.6 | 101.6 | 101.2 | 101.2 | 100.3 | 100.3 | 99.9 | 99.1 | 98.3 | 97.5 |
| 7.5° | 109.4 | 109.0 | 109.0 | 108.6 | 108.2 | 107.3 | 106.9 | 106.5 | 104.9 | 103.6 | 102.0 |
| 10° | 118.8 | 118.8 | 118.4 | 117.6 | 117.6 | 115.6 | 116.0 | 115.1 | 113.1 | 110.6 | 107.7 |
| 12.5° | 130.4 | 130.4 | 129.5 | 129.5 | 128.7 | 127.1 | 126.7 | 125.4 | 123.4 | 119.3 | 116.0 |
| 15° | 143.1 | 143.1 | 143.9 | 143.1 | 142.3 | 140.2 | 140.2 | 138.6 | 134.1 | 130.8 | 125.8 |
| 17.5° | 159.1 | 157.1 | 158.3 | 157.9 | 157.9 | 156.7 | 155.4 | 153.4 | 149.7 | 143.9 | 137.8 |
| 20° | 175.6 | 176.0 | 174.8 | 176.0 | 176.4 | 174.8 | 174.8 | 172.3 | 167.0 | 160.0 | 150.1 |
| 22.5° | 196.2 | 196.2 | 193.7 | 197.0 | 199.0 | 197.8 | 197.4 | 192.4 | 185.9 | 176.4 | 166.5 |
| 25° | 217.5 | 216.7 | 220.8 | 221.6 | 226.2 | 225.8 | 225.3 | 220.8 | 211.0 | 199.4 | 184.2 |
| 27.5° | 241.8 | 243.0 | 250.8 | 252.9 | 257.4 | 257.0 | 256.6 | 251.7 | 241.0 | 225.3 | 205.6 |
| 30° | 271.8 | 273.5 | 280.9 | 287.9 | 295.7 | 296.5 | 295.7 | 291.6 | 275.9 | 255.4 | 233.2 |
| 32.5° | 306.8 | 311.3 | 318.7 | 330.6 | 340.5 | 345.0 | 345.8 | 338.4 | 320.7 | 293.6 | 264.4 |
| 35° | 354.5 | 350.8 | 361.0 | 380.8 | 397.2 | 406.3 | 405.9 | 396.0 | 376.7 | 342.1 | 300.6 |
| 37.5° | 401.3 | 400.1 | 416.2 | 442.1 | 464.3 | 471.7 | 473.7 | 467.1 | 442.5 | 396.8 | 347.9 |
| 40° | 450.3 | 460.6 | 479.1 | 509.1 | 542.0 | 557.6 | 558.8 | 549.4 | 515.7 | 464.3 | 399.7 |
| 42.5° | 514.0 | 524.3 | 547.7 | 584.8 | 632.5 | 658.4 | 660.0 | 649.3 | 608.6 | 542.0 | 462.2 |
| 45° | 594.6 | 600.4 | 625.1 | 681.4 | 742.7 | 784.2 | 796.1 | 783.0 | 732.8 | 640.3 | 539.9 |
| 47.5° | 681.4 | 681.4 | 721.7 | 796.1 | 888.6 | 943.3 | 952.4 | 940.5 | 865.6 | 754.2 | 626.7 |
| 50° | 778.0 | 778.4 | 842.6 | 949.1 | 1065.9 | 1134.1 | 1141.1 | 1112.3 | 1021.9 | 870.1 | 715.1 |
| 52.5° | 878.4 | 889.1 | 982.8 | 1144.0 | 1300.7 | 1405.1 | 1412.1 | 1378.8 | 1258.3 | 1036.3 | 809.3 |
| 55° | 1016.5 | 1033.4 | 1169.5 | 1367.3 | 1530.1 | 1612.4 | 1612.8 | 1572.9 | 1428.2 | 1197.5 | 921.9 |
| 57.5° | 1208.2 | 1214.7 | 1341.8 | 1543.7 | 1697.5 | 1753.8 | 1749.7 | 1691.3 | 1524.4 | 1287.5 | 1014.5 |
| 60° | 1366.5 | 1381.7 | 1485.3 | 1672.8 | 1822.9 | 1861.6 | 1857.1 | 1779.7 | 1590.2 | 1340.2 | 1058.9 |
| 62.5° | 1470.5 | 1477.9 | 1585.2 | 1765.4 | 1900.2 | 1932.7 | 1927.8 | 1855.8 | 1670.8 | 1431.9 | 1132.9 |
| 65° | 1495.6 | 1507.9 | 1644.0 | 1827.0 | 1957.8 | 2031.0 | 2027.7 | 1989.1 | 1799.1 | 1499.7 | 1167.9 |
| 67.5° | 1465.2 | 1485.7 | 1652.7 | 1869.4 | 2026.9 | 2087.7 | 2086.1 | 2008.4 | 1771.5 | 1456.1 | 1123.9 |
| 70° | 1403.1 | 1420.8 | 1628.0 | 1864.9 | 2006.7 | 2023.2 | 2010.4 | 1921.6 | 1690.5 | 1383.7 | 1058.1 |
| 72.5° | 1305.2 | 1335.2 | 1537.5 | 1761.7 | 1880.1 | 1890.8 | 1886.3 | 1777.7 | 1568.8 | 1259.1 | 958.5 |
| 75° | 1176.9 | 1213.5 | 1396.9 | 1578.3 | 1690.9 | 1709.4 | 1700.8 | 1605.8 | 1394.4 | 1103.3 | 835.2 |
| 77.5° | 1014.5 | 1035.0 | 1174.8 | 1347.1 | 1476.7 | 1480.0 | 1475.0 | 1368.9 | 1174.4 | 924.0 | 702.8 |
| 80° | 799.4 | 811.7 | 933.1 | 1076.6 | 1183.9 | 1197.1 | 1192.5 | 1121.0 | 932.6 | 731.1 | 548.2 |
| 82.5° | 592.2 | 583.9 | 665.3 | 783.0 | 889.5 | 890.3 | 897.7 | 818.3 | 698.2 | 530.5 | 392.3 |
| 85° | 340.9 | 344.2 | 414.9 | 495.1 | 559.7 | 597.1 | 596.7 | 558.4 | 449.0 | 337.6 | 239.3 |
| 87.5° | 95.0 | 102.4 | 147.2 | 214.2 | 243.4 | 264.8 | 257.0 | 231.9 | 187.5 | 106.1 | 60.9 |
| 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: P880257

CATALOG NUMBER: EMM2-HSN-VA2-730-U-WT4

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 | 92.9 |
| 2.5° | 94.2 | 93.8 | 93.3 | 92.9 | 92.1 | 92.1 | 91.7 | 92.1 | 92.1 | 92.1 | 92.1 |
| 5° | 96.6 | 96.2 | 95.0 | 94.2 | 92.9 | 92.1 | 91.7 | 91.7 | 91.7 | 91.7 | 91.7 |
| 7.5° | 100.7 | 100.3 | 98.3 | 96.6 | 95.0 | 94.2 | 93.3 | 92.9 | 92.5 | 92.1 | 92.5 |
| 10° | 106.9 | 105.3 | 103.2 | 100.7 | 98.3 | 97.0 | 95.8 | 95.4 | 95.0 | 94.6 | 94.6 |
| 12.5° | 113.9 | 112.7 | 109.0 | 105.7 | 103.2 | 101.2 | 99.5 | 98.7 | 98.3 | 97.9 | 97.9 |
| 15° | 123.4 | 120.9 | 116.0 | 111.9 | 108.2 | 105.7 | 104.0 | 103.2 | 102.8 | 102.4 | 102.4 |
| 17.5° | 134.1 | 130.8 | 124.2 | 118.8 | 114.7 | 111.4 | 109.4 | 108.2 | 107.3 | 107.7 | 108.2 |
| 20° | 146.4 | 141.0 | 133.6 | 127.1 | 121.7 | 118.0 | 116.0 | 114.3 | 113.5 | 113.9 | 114.3 |
| 22.5° | 160.8 | 155.0 | 144.3 | 136.5 | 129.9 | 125.4 | 123.4 | 122.1 | 121.3 | 120.9 | 120.1 |
| 25° | 177.2 | 169.8 | 157.5 | 146.8 | 139.0 | 134.5 | 132.0 | 131.2 | 130.4 | 129.5 | 129.5 |
| 27.5° | 197.0 | 188.3 | 171.5 | 160.0 | 150.5 | 146.0 | 143.1 | 141.9 | 141.9 | 140.6 | 140.6 |
| 30° | 220.0 | 208.5 | 187.9 | 172.7 | 163.3 | 157.5 | 154.2 | 153.8 | 153.0 | 154.2 | 154.2 |
| 32.5° | 247.6 | 231.9 | 206.8 | 189.2 | 178.5 | 173.1 | 169.8 | 169.0 | 167.8 | 168.6 | 171.1 |
| 35° | 282.1 | 261.9 | 231.9 | 211.0 | 197.8 | 192.4 | 188.3 | 187.9 | 185.9 | 187.9 | 184.6 |
| 37.5° | 320.7 | 298.5 | 258.7 | 234.0 | 219.6 | 213.4 | 210.5 | 209.3 | 208.9 | 208.9 | 206.4 |
| 40° | 368.0 | 341.3 | 292.8 | 262.4 | 245.9 | 238.5 | 235.6 | 235.2 | 234.4 | 237.3 | 234.4 |
| 42.5° | 426.4 | 385.7 | 328.2 | 293.6 | 276.7 | 268.9 | 265.6 | 264.4 | 266.5 | 267.7 | 267.3 |
| 45° | 491.4 | 447.4 | 373.4 | 333.5 | 314.2 | 306.4 | 301.8 | 300.6 | 301.4 | 301.4 | 305.5 |
| 47.5° | 566.2 | 514.4 | 425.2 | 377.1 | 359.4 | 349.9 | 347.1 | 343.0 | 340.9 | 340.1 | 347.1 |
| 50° | 644.4 | 579.8 | 478.2 | 424.4 | 408.3 | 400.9 | 401.8 | 393.5 | 390.7 | 387.4 | 386.5 |
| 52.5° | 722.9 | 649.7 | 538.7 | 490.2 | 471.7 | 475.4 | 473.7 | 465.1 | 448.2 | 444.1 | 434.2 |
| 55° | 817.1 | 728.7 | 596.7 | 538.7 | 522.7 | 525.5 | 532.1 | 532.1 | 528.4 | 519.4 | 511.6 |
| 57.5° | 896.9 | 794.1 | 640.3 | 567.9 | 553.9 | 561.3 | 574.5 | 584.3 | 593.0 | 599.6 | 599.1 |
| 60° | 941.3 | 834.4 | 668.6 | 590.1 | 573.6 | 588.0 | 607.8 | 624.6 | 643.1 | 662.5 | 661.6 |
| 62.5° | 1002.5 | 890.7 | 719.2 | 629.6 | 601.2 | 605.7 | 628.3 | 657.5 | 674.4 | 690.4 | 695.0 |
| 65° | 1018.6 | 901.0 | 738.1 | 657.5 | 634.5 | 635.3 | 650.5 | 674.4 | 688.8 | 692.9 | 695.4 |
| 67.5° | 975.4 | 855.7 | 706.9 | 641.1 | 628.8 | 640.3 | 664.9 | 683.9 | 685.9 | 676.0 | 675.2 |
| 70° | 910.4 | 800.2 | 657.5 | 602.4 | 594.6 | 612.3 | 644.8 | 667.4 | 662.5 | 642.3 | 641.1 |
| 72.5° | 818.7 | 716.3 | 591.3 | 551.4 | 543.6 | 565.8 | 594.6 | 618.5 | 611.1 | 595.9 | 594.6 |
| 75° | 708.5 | 612.7 | 511.1 | 481.5 | 481.1 | 505.4 | 530.5 | 544.9 | 544.5 | 533.8 | 530.5 |
| 77.5° | 588.9 | 511.1 | 421.1 | 394.4 | 404.2 | 427.3 | 445.8 | 456.5 | 452.8 | 449.0 | 447.8 |
| 80° | 461.0 | 391.9 | 324.9 | 308.8 | 324.0 | 331.9 | 351.6 | 350.8 | 352.8 | 345.0 | 350.8 |
| 82.5° | 328.2 | 282.5 | 232.7 | 225.8 | 227.8 | 243.4 | 254.1 | 252.9 | 247.6 | 241.8 | 239.3 |
| 85° | 199.0 | 173.9 | 149.3 | 139.4 | 146.4 | 145.2 | 151.7 | 146.4 | 143.1 | 140.2 | 142.7 |
| 87.5° | 55.1 | 47.7 | 45.6 | 32.9 | 40.7 | 32.1 | 33.7 | 23.4 | 20.6 | 24.7 | 21.4 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-176-3

Test Date: 09/24/2024

Luminaire Tested: MEM2-HTN-VA-30-730-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-30-730-U-WQ

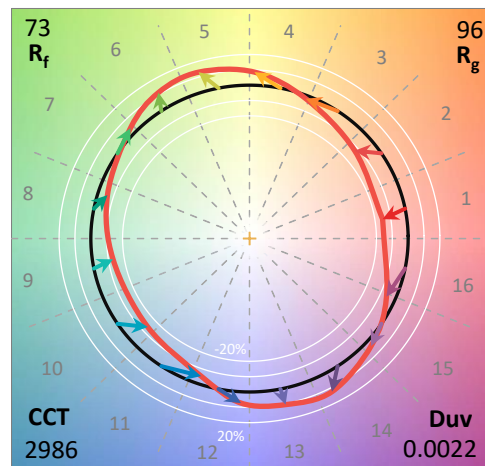
Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-176-3
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 09/27/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-VA-30-730-U-WQ**
 Description: EPIC MODERN VISUAL COMFORT 30W WAVESTREAM WIDE

Spectral Parameters

CCT (K): 2986
 CIE u': 0.2503
 CIE v': 0.5248
 Duv: 0.0022
 CIE x: 0.4413
 CIE y: 0.4112
 CIE z: 0.1476
 Peak Wavelength (nm): 596
 Dominant Wavelength (nm): 582
 Purity: 55.87534
 Rf: 73.2
 Rg: 95.9

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.3 | | |
| R1: | 68.5 | R9: | -25.2 |
| R2: | 79.2 | R10: | 51.0 |
| R3: | 88.4 | R11: | 63.6 |
| R4: | 69.4 | R12: | 39.8 |
| R5: | 66.3 | R13: | 69.9 |
| R6: | 70.0 | R14: | 92.9 |
| R7: | 80.1 | R15: | 61.4 |
| R8: | 48.3 | | |



Test Conditions

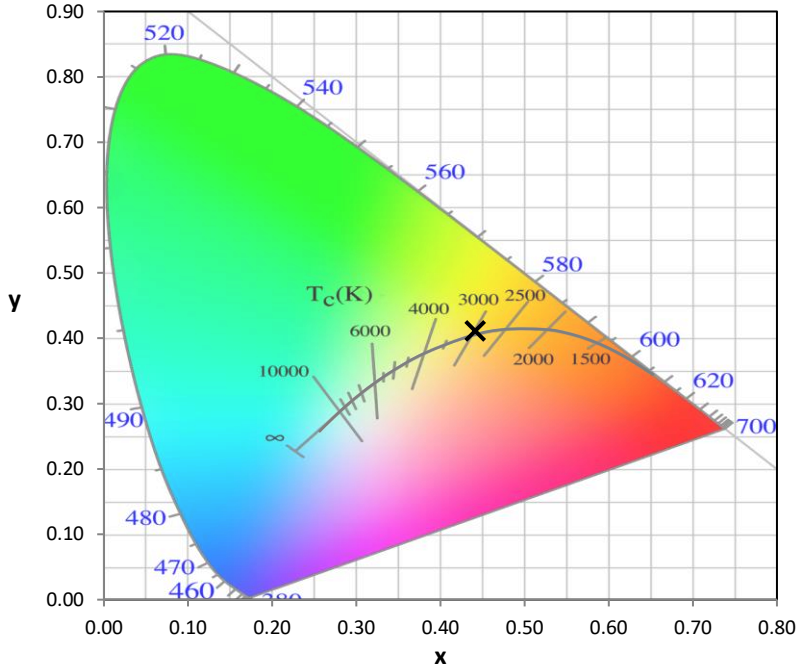
Stabilization Time: 27M
 Operation Time: 1H 27M
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-176-3

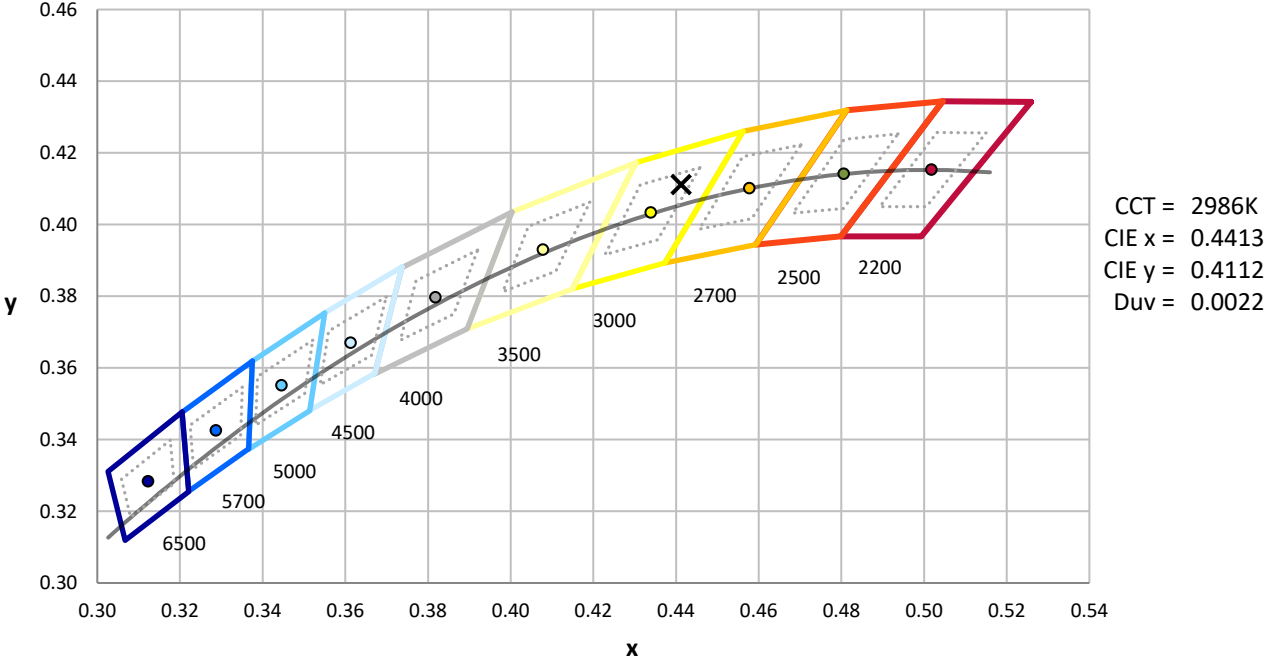
| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC Power Source | IN0208 | 10/24/2023 | 10/24/2024 |
| Sphere Thermometer | IN0085 | 10/24/2023 | 10/24/2024 |
| Room Thermometer | IN0046 | 10/24/2023 | 10/24/2024 |

REPORT NUMBER: SP1-2407-176-3

CIE 1931 Chromaticity Diagram



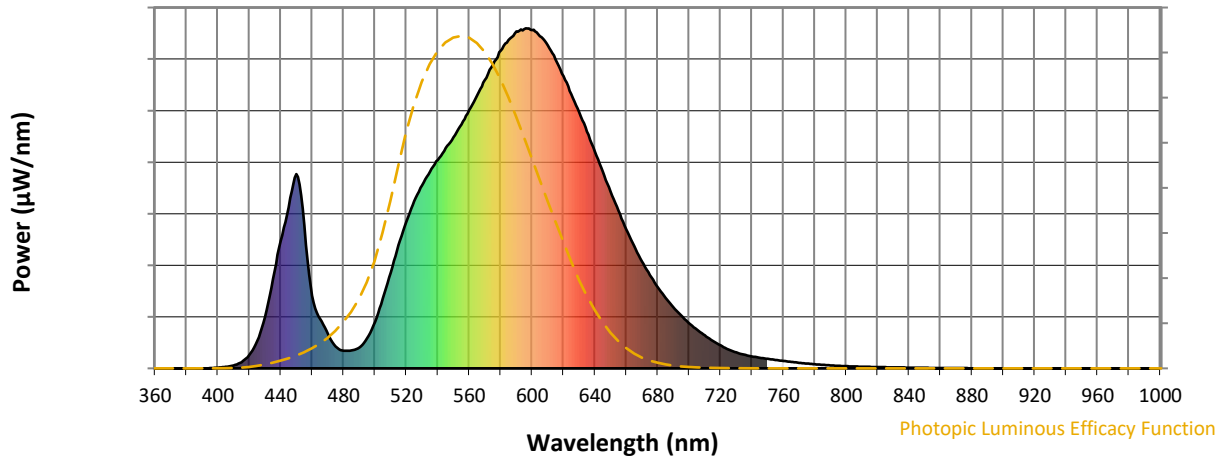
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2407-176-3

Photopic Flux vs. Wavelength

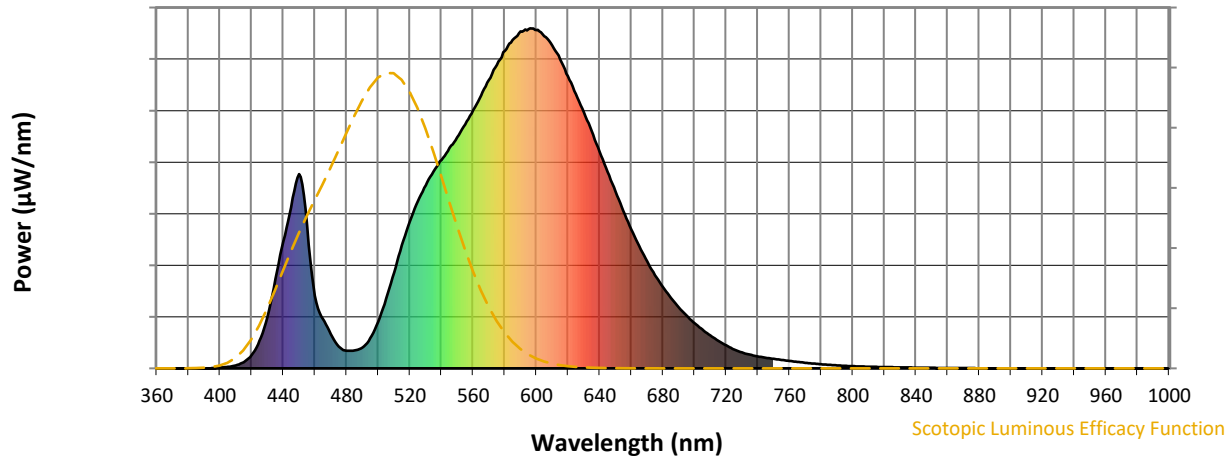


Photopic Lumens: NR

| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 61 | NR | 620 | 859 | NR | 750 | 28 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 88 | NR | 625 | 807 | NR | 755 | 25 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 137 | NR | 630 | 753 | NR | 760 | 22 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 205 | NR | 635 | 697 | NR | 765 | 19 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 281 | NR | 640 | 637 | NR | 770 | 16 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 363 | NR | 645 | 578 | NR | 775 | 14 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 432 | NR | 650 | 520 | NR | 780 | 12 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 492 | NR | 655 | 463 | NR | 785 | 10 | NR | 915 | 0 | NR |
| 400 | 2 | NR | 530 | 539 | NR | 660 | 409 | NR | 790 | 9 | NR | 920 | 0 | NR |
| 405 | 4 | NR | 535 | 579 | NR | 665 | 359 | NR | 795 | 8 | NR | 925 | 0 | NR |
| 410 | 9 | NR | 540 | 613 | NR | 670 | 315 | NR | 800 | 6 | NR | 930 | 0 | NR |
| 415 | 18 | NR | 545 | 648 | NR | 675 | 274 | NR | 805 | 6 | NR | 935 | 0 | NR |
| 420 | 39 | NR | 550 | 680 | NR | 680 | 239 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 81 | NR | 555 | 717 | NR | 685 | 207 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 151 | NR | 560 | 759 | NR | 690 | 180 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 263 | NR | 565 | 803 | NR | 695 | 155 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 375 | NR | 570 | 848 | NR | 700 | 133 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 474 | NR | 575 | 892 | NR | 705 | 114 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 571 | NR | 580 | 933 | NR | 710 | 97 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 421 | NR | 585 | 966 | NR | 715 | 81 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 214 | NR | 590 | 991 | NR | 720 | 67 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 146 | NR | 595 | 998 | NR | 725 | 55 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 101 | NR | 600 | 995 | NR | 730 | 47 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 64 | NR | 605 | 977 | NR | 735 | 40 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 52 | NR | 610 | 949 | NR | 740 | 35 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 53 | NR | 615 | 908 | NR | 745 | 31 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-176-3

Scotopic Flux vs. Wavelength



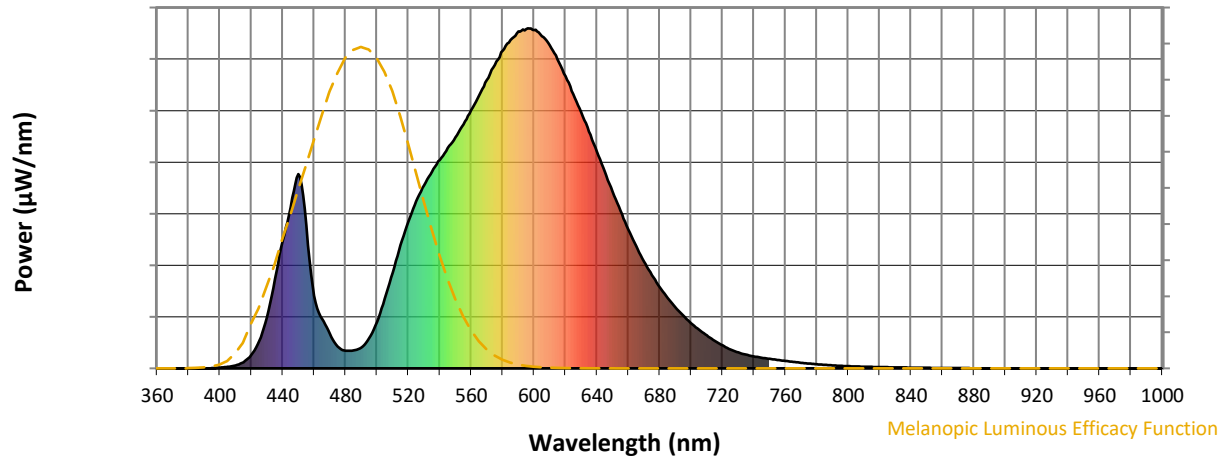
Scotopic Lumens: NR

S/P: 1.15

| λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) | λ (nm) | Power W [^] /nm | Lumens (ϕ /nm) |
|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|
| 360 | 0 | NR | 490 | 61 | NR | 620 | 859 | NR | 750 | 28 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 88 | NR | 625 | 807 | NR | 755 | 25 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 137 | NR | 630 | 753 | NR | 760 | 22 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 205 | NR | 635 | 697 | NR | 765 | 19 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 281 | NR | 640 | 637 | NR | 770 | 16 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 363 | NR | 645 | 578 | NR | 775 | 14 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 432 | NR | 650 | 520 | NR | 780 | 12 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 492 | NR | 655 | 463 | NR | 785 | 10 | NR | 915 | 0 | NR |
| 400 | 2 | NR | 530 | 539 | NR | 660 | 409 | NR | 790 | 9 | NR | 920 | 0 | NR |
| 405 | 4 | NR | 535 | 579 | NR | 665 | 359 | NR | 795 | 8 | NR | 925 | 0 | NR |
| 410 | 9 | NR | 540 | 613 | NR | 670 | 315 | NR | 800 | 6 | NR | 930 | 0 | NR |
| 415 | 18 | NR | 545 | 648 | NR | 675 | 274 | NR | 805 | 6 | NR | 935 | 0 | NR |
| 420 | 39 | NR | 550 | 680 | NR | 680 | 239 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 81 | NR | 555 | 717 | NR | 685 | 207 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 151 | NR | 560 | 759 | NR | 690 | 180 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 263 | NR | 565 | 803 | NR | 695 | 155 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 375 | NR | 570 | 848 | NR | 700 | 133 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 474 | NR | 575 | 892 | NR | 705 | 114 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 571 | NR | 580 | 933 | NR | 710 | 97 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 421 | NR | 585 | 966 | NR | 715 | 81 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 214 | NR | 590 | 991 | NR | 720 | 67 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 146 | NR | 595 | 998 | NR | 725 | 55 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 101 | NR | 600 | 995 | NR | 730 | 47 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 64 | NR | 605 | 977 | NR | 735 | 40 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 52 | NR | 610 | 949 | NR | 740 | 35 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 53 | NR | 615 | 908 | NR | 745 | 31 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-176-3

Melanopic Flux vs. Wavelength



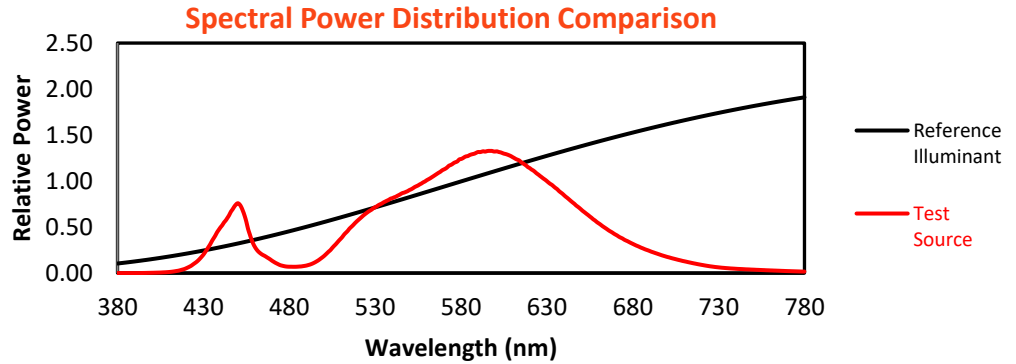
Melanopic Lumens: NR

M/P: 2.01

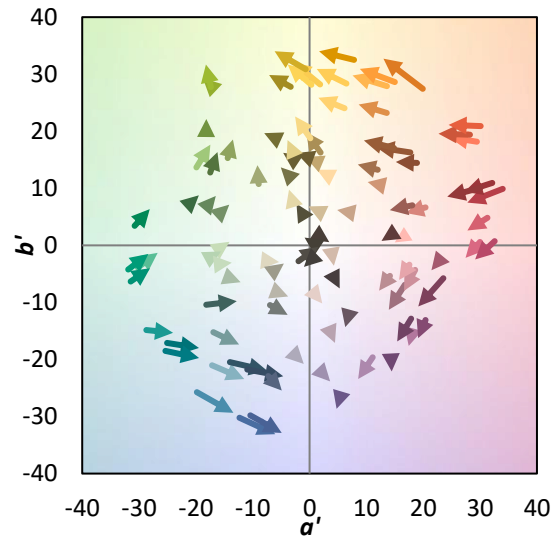
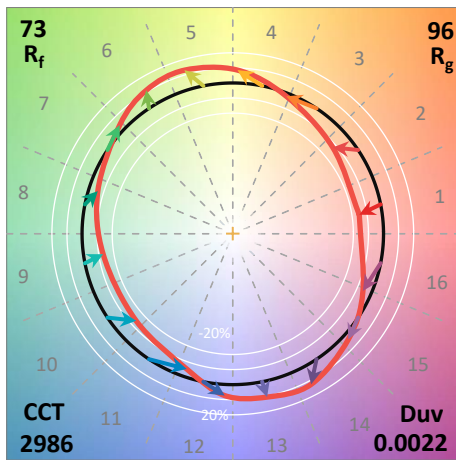
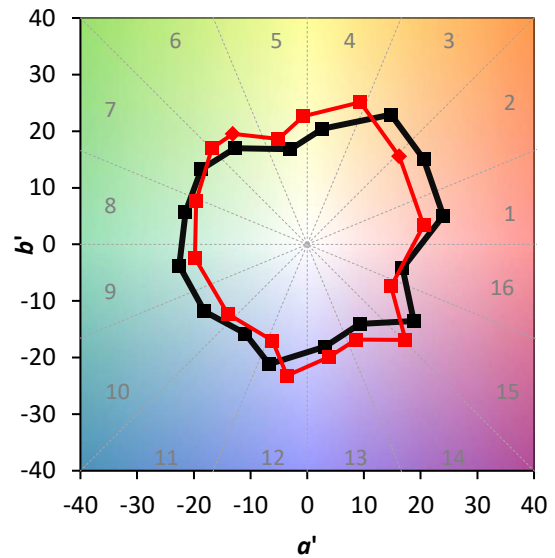
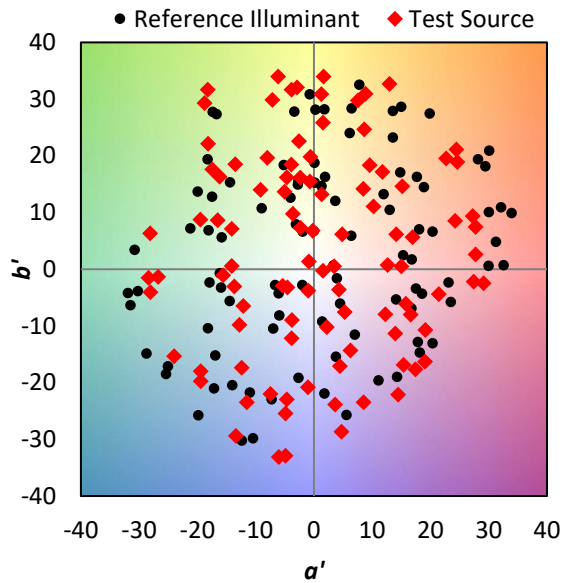
| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 61 | NR | 620 | 859 | NR | 750 | 28 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 88 | NR | 625 | 807 | NR | 755 | 25 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 137 | NR | 630 | 753 | NR | 760 | 22 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 205 | NR | 635 | 697 | NR | 765 | 19 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 281 | NR | 640 | 637 | NR | 770 | 16 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 363 | NR | 645 | 578 | NR | 775 | 14 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 432 | NR | 650 | 520 | NR | 780 | 12 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 492 | NR | 655 | 463 | NR | 785 | 10 | NR | 915 | 0 | NR |
| 400 | 2 | NR | 530 | 539 | NR | 660 | 409 | NR | 790 | 9 | NR | 920 | 0 | NR |
| 405 | 4 | NR | 535 | 579 | NR | 665 | 359 | NR | 795 | 8 | NR | 925 | 0 | NR |
| 410 | 9 | NR | 540 | 613 | NR | 670 | 315 | NR | 800 | 6 | NR | 930 | 0 | NR |
| 415 | 18 | NR | 545 | 648 | NR | 675 | 274 | NR | 805 | 6 | NR | 935 | 0 | NR |
| 420 | 39 | NR | 550 | 680 | NR | 680 | 239 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 81 | NR | 555 | 717 | NR | 685 | 207 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 151 | NR | 560 | 759 | NR | 690 | 180 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 263 | NR | 565 | 803 | NR | 695 | 155 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 375 | NR | 570 | 848 | NR | 700 | 133 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 474 | NR | 575 | 892 | NR | 705 | 114 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 571 | NR | 580 | 933 | NR | 710 | 97 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 421 | NR | 585 | 966 | NR | 715 | 81 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 214 | NR | 590 | 991 | NR | 720 | 67 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 146 | NR | 595 | 998 | NR | 725 | 55 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 101 | NR | 600 | 995 | NR | 730 | 47 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 64 | NR | 605 | 977 | NR | 735 | 40 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 52 | NR | 610 | 949 | NR | 740 | 35 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 53 | NR | 615 | 908 | NR | 745 | 31 | NR | 875 | 1 | NR | | | |

Summary

$R_f = 73.2$
 $R_g = 95.9$
 $CIE R_a = 71.3$
 $R_9 = -25.2$

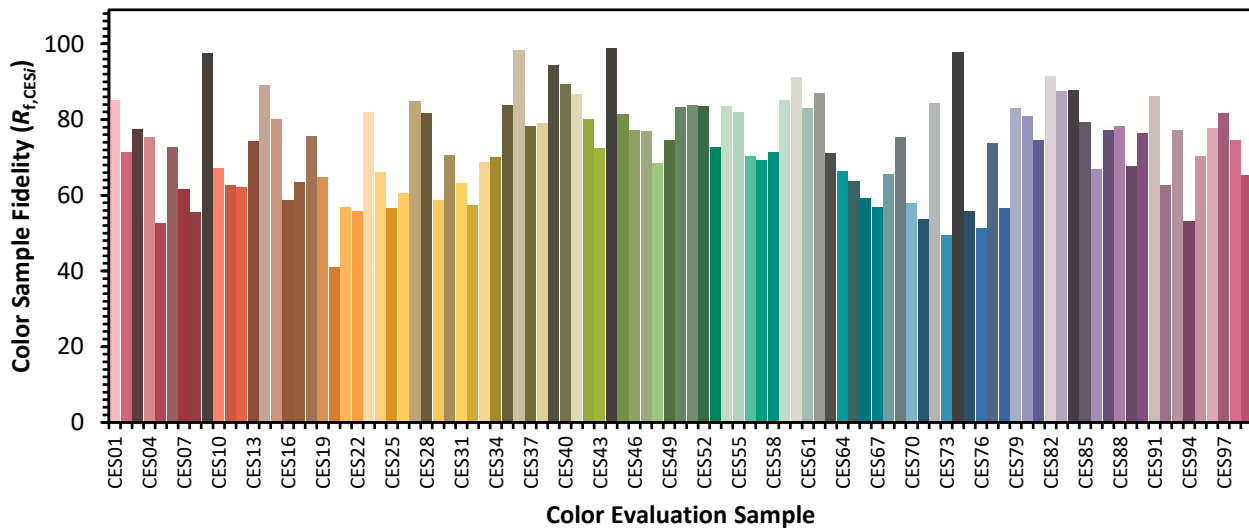


Color Vector Graphics

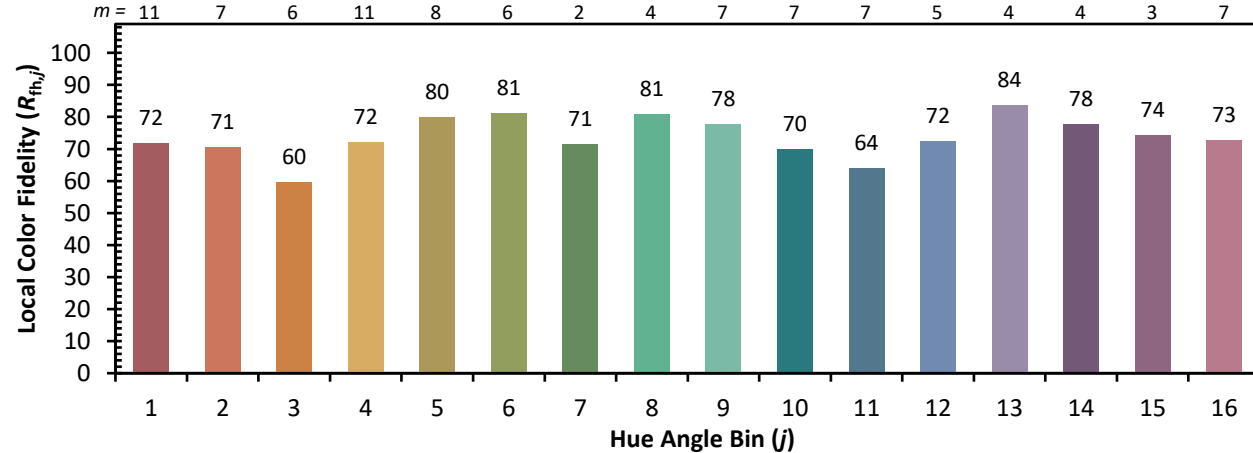
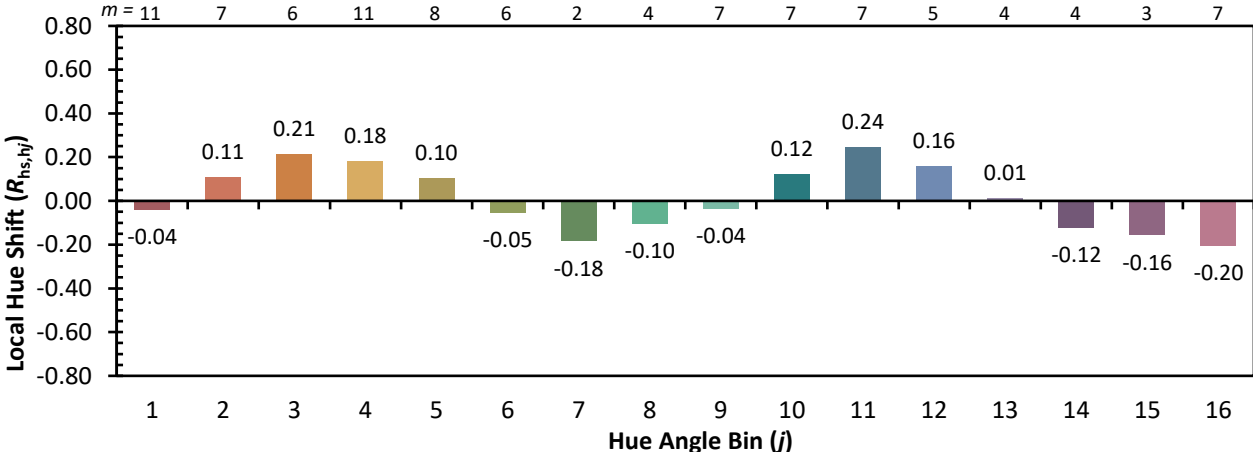
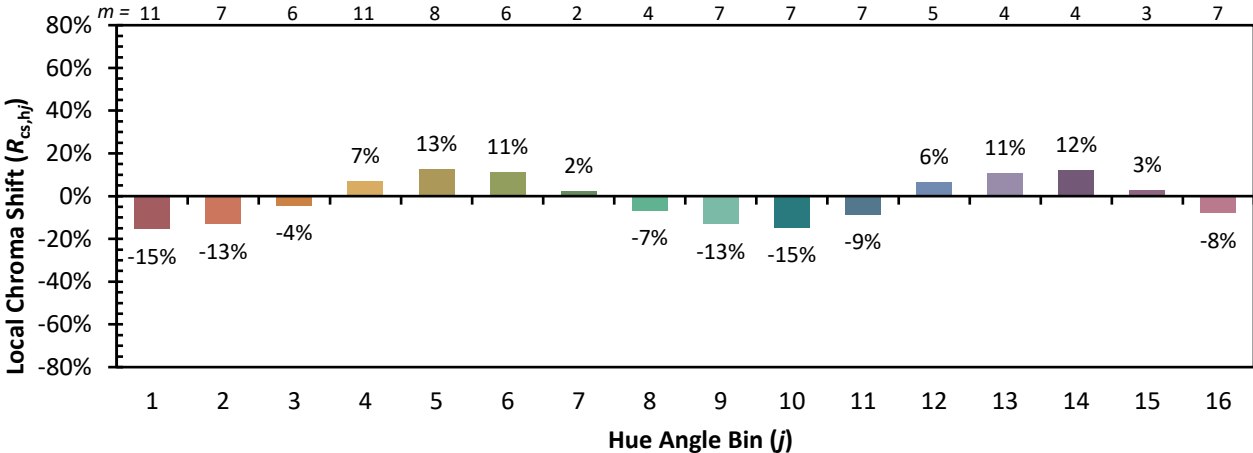


Individual Sample Fidelity Index ($R_{f,i}$)

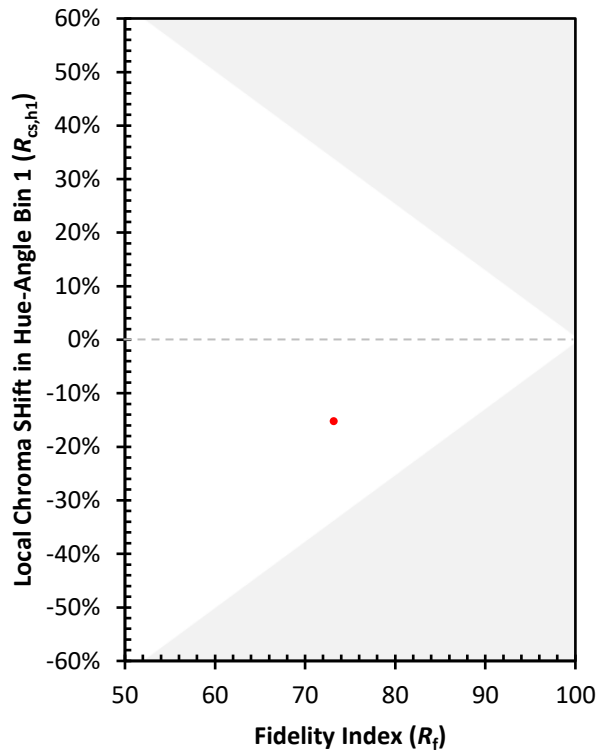
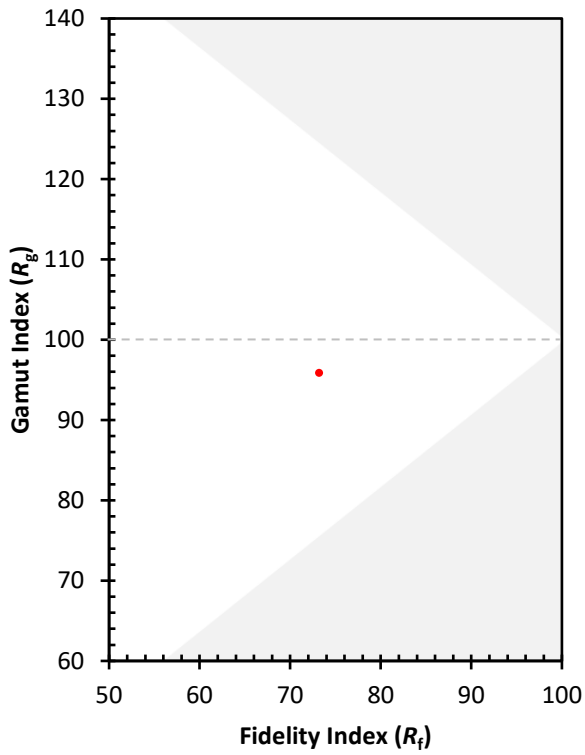
| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 61 | CES51 = 84 | CES76 = 51 |
| CES02 = 62 | CES27 = 85 | CES52 = 84 | CES77 = 74 |
| CES03 = 31 | CES28 = 82 | CES53 = 73 | CES78 = 56 |
| CES04 = 71 | CES29 = 59 | CES54 = 84 | CES79 = 83 |
| CES05 = 49 | CES30 = 71 | CES55 = 82 | CES80 = 81 |
| CES06 = 51 | CES31 = 63 | CES56 = 70 | CES81 = 75 |
| CES07 = 41 | CES32 = 57 | CES57 = 69 | CES82 = 92 |
| CES08 = 40 | CES33 = 69 | CES58 = 71 | CES83 = 88 |
| CES09 = 29 | CES34 = 70 | CES59 = 85 | CES84 = 88 |
| CES10 = 76 | CES35 = 84 | CES60 = 91 | CES85 = 79 |
| CES11 = 59 | CES36 = 98 | CES61 = 83 | CES86 = 67 |
| CES12 = 65 | CES37 = 78 | CES62 = 87 | CES87 = 77 |
| CES13 = 43 | CES38 = 79 | CES63 = 71 | CES88 = 78 |
| CES14 = 74 | CES39 = 94 | CES64 = 66 | CES89 = 68 |
| CES15 = 71 | CES40 = 89 | CES65 = 64 | CES90 = 76 |
| CES16 = 47 | CES41 = 87 | CES66 = 59 | CES91 = 86 |
| CES17 = 50 | CES42 = 80 | CES67 = 57 | CES92 = 63 |
| CES18 = 56 | CES43 = 73 | CES68 = 66 | CES93 = 77 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 53 |
| CES20 = 66 | CES45 = 81 | CES70 = 58 | CES95 = 70 |
| CES21 = 87 | CES46 = 77 | CES71 = 54 | CES96 = 78 |
| CES22 = 79 | CES47 = 77 | CES72 = 84 | CES97 = 82 |
| CES23 = 92 | CES48 = 68 | CES73 = 49 | CES98 = 75 |
| CES24 = 91 | CES49 = 74 | CES74 = 98 | CES99 = 65 |
| CES25 = 73 | CES50 = 83 | CES75 = 56 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)