

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: P413324

Luminaire Tested: **TT-D4-750-U-RW-PM**

Issue Date: 10/15/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P413324  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2010-981-1)  
Test Lab: INNOVATION CENTER  
Issue Date: 10/15/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: TT-D4-750-U-RW-PM  
Description: TOPTIER LED SITE LUMINAIRE  
5000K, 70 CRI LEDS AND RECTANGULAR DISTRIBUTION  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6050 lumens  
Efficiency: N/A  
Efficacy: 105.0 lumens/watt  
Luminous Opening: Circular (Dia: 1.12' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G3

Input Watts (W): 57.6  
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



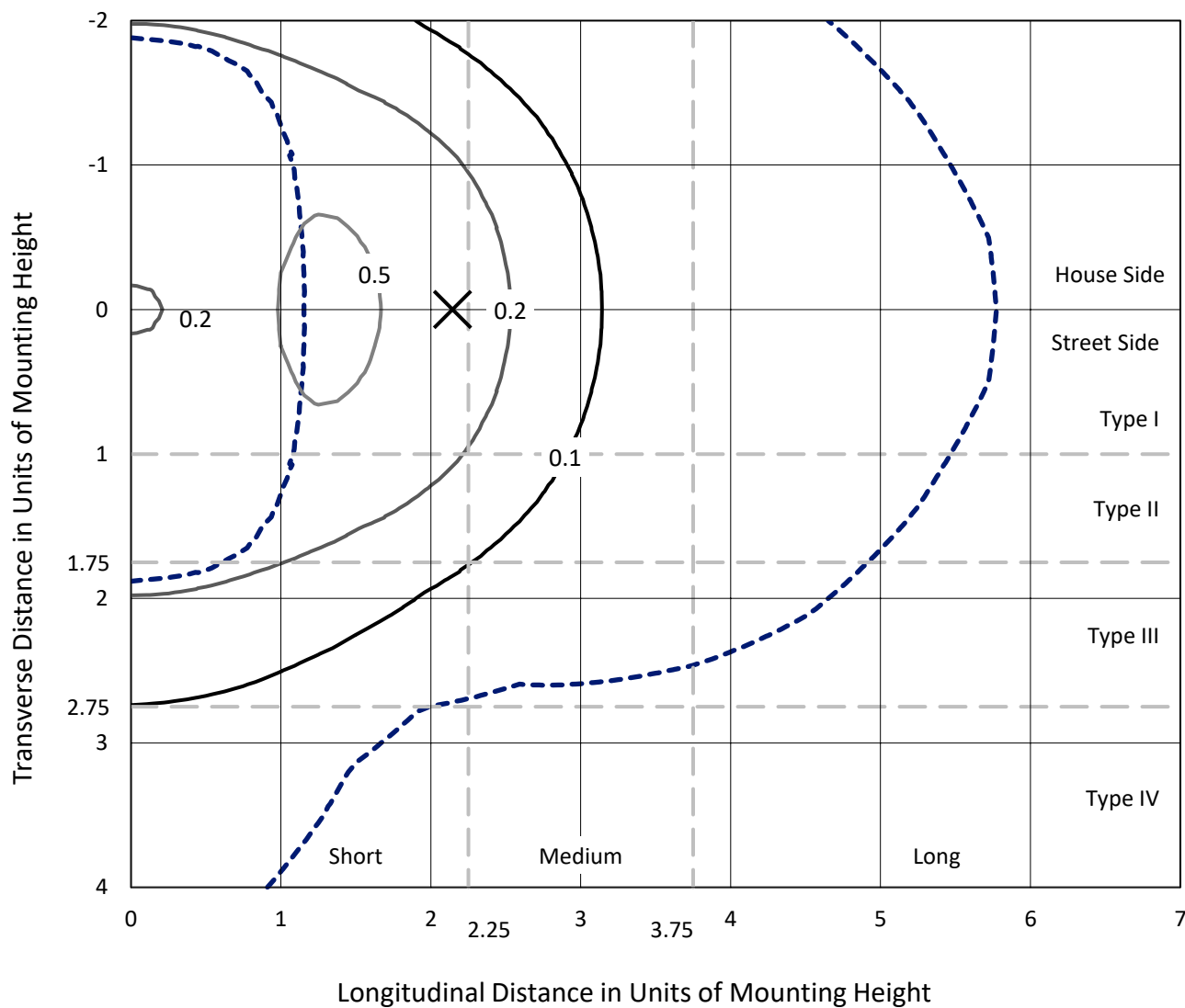
REPORT NUMBER: P413324

CATALOG NUMBER: TT-D4-750-U-RW-PM

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

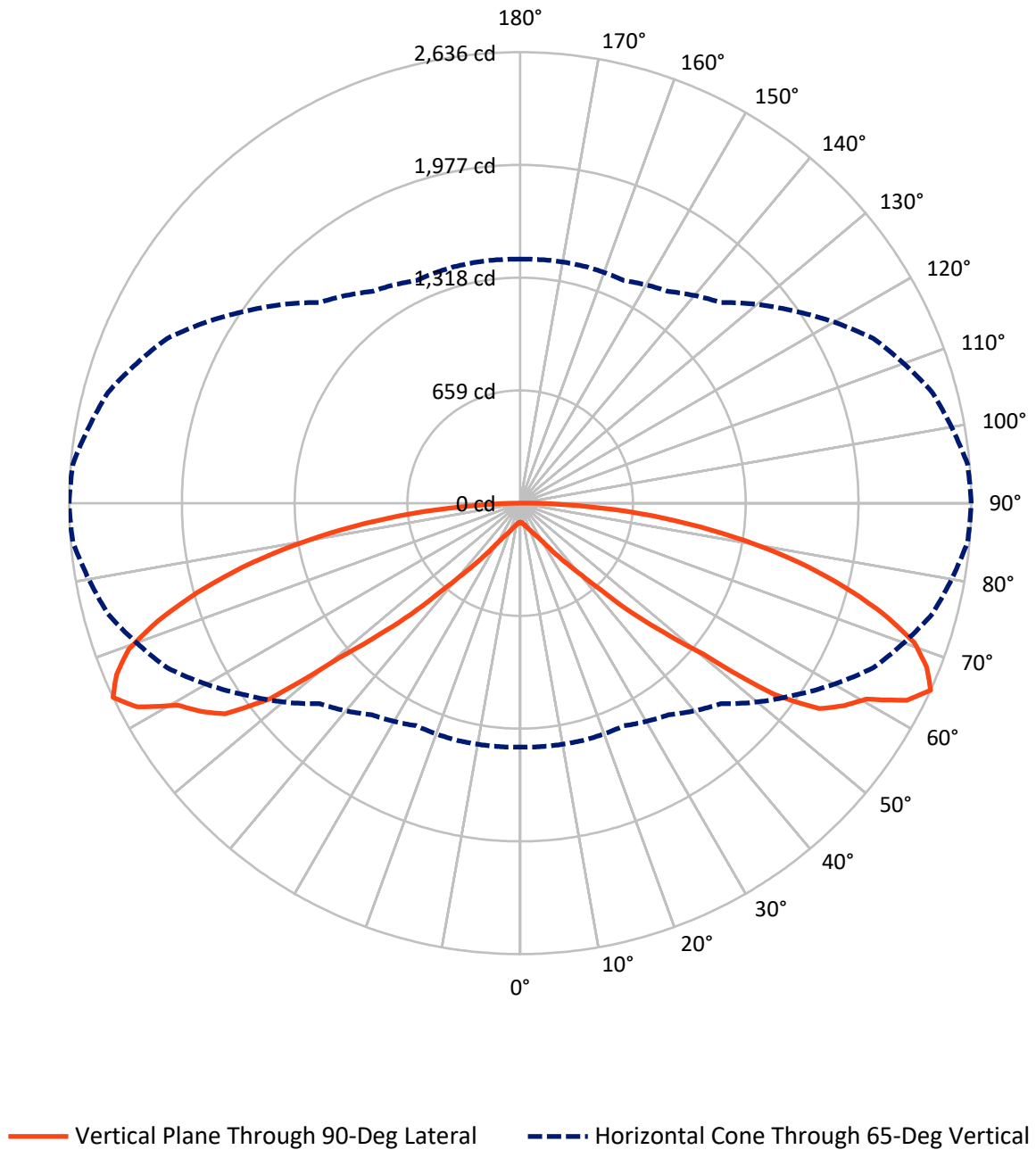
--- 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.7 fc  
 Type IV - Short - N/A

REPORT NUMBER: P413324  
CATALOG NUMBER: TT-D4-750-U-RW-PM

## Luminous Intensity Polar Plot



REPORT NUMBER: P413324

CATALOG NUMBER: TT-D4-750-U-RW-PM

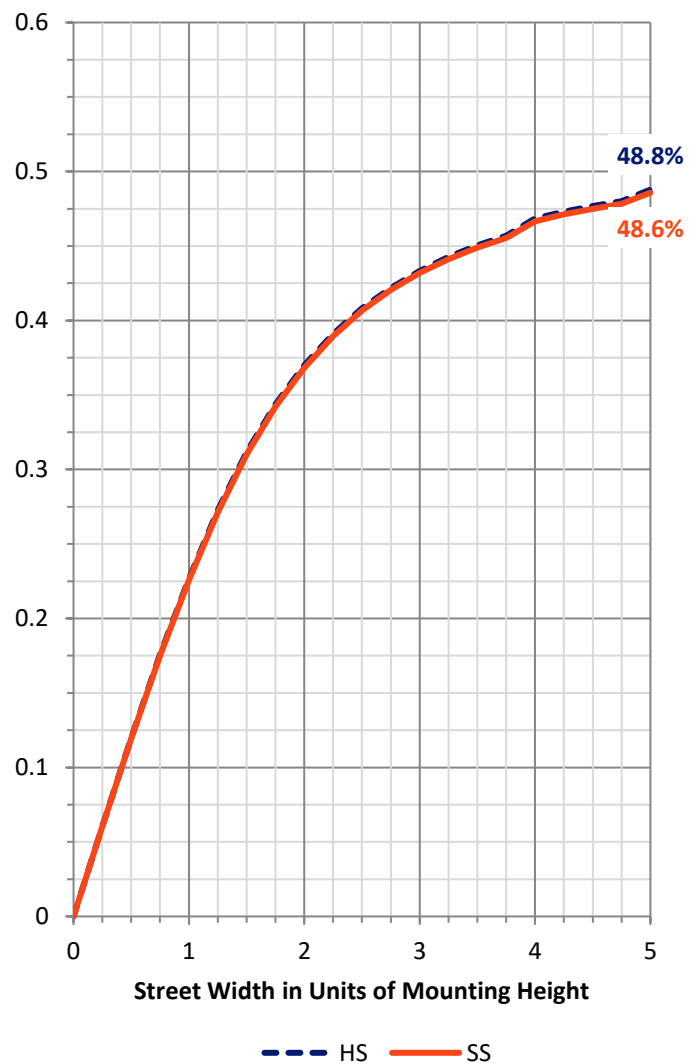
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 3025.0   | 0.0    | 3025.0 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Street Side</b> | Lumens    | 3025.0   | 0.0    | 3025.0 |
|                    | % Fixture | 50.0     | 0.0    | 50.0   |
| <b>Total</b>       | Lumens    | 6050.0   | 0.0    | 6050.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 11.5   | 0.2       |
| 10°-20°   | 43.1   | 0.7       |
| 20°-30°   | 99.7   | 1.6       |
| 30°-40°   | 225.4  | 3.7       |
| 40°-50°   | 549.1  | 9.1       |
| 50°-60°   | 1234.8 | 20.4      |
| 60°-70°   | 1804.6 | 29.8      |
| 70°-80°   | 1572.4 | 26.0      |
| 80°-90°   | 509.3  | 8.4       |
| 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°    | 6050.0 | 100.0     |
| 0°-180°   | 6050.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P413324

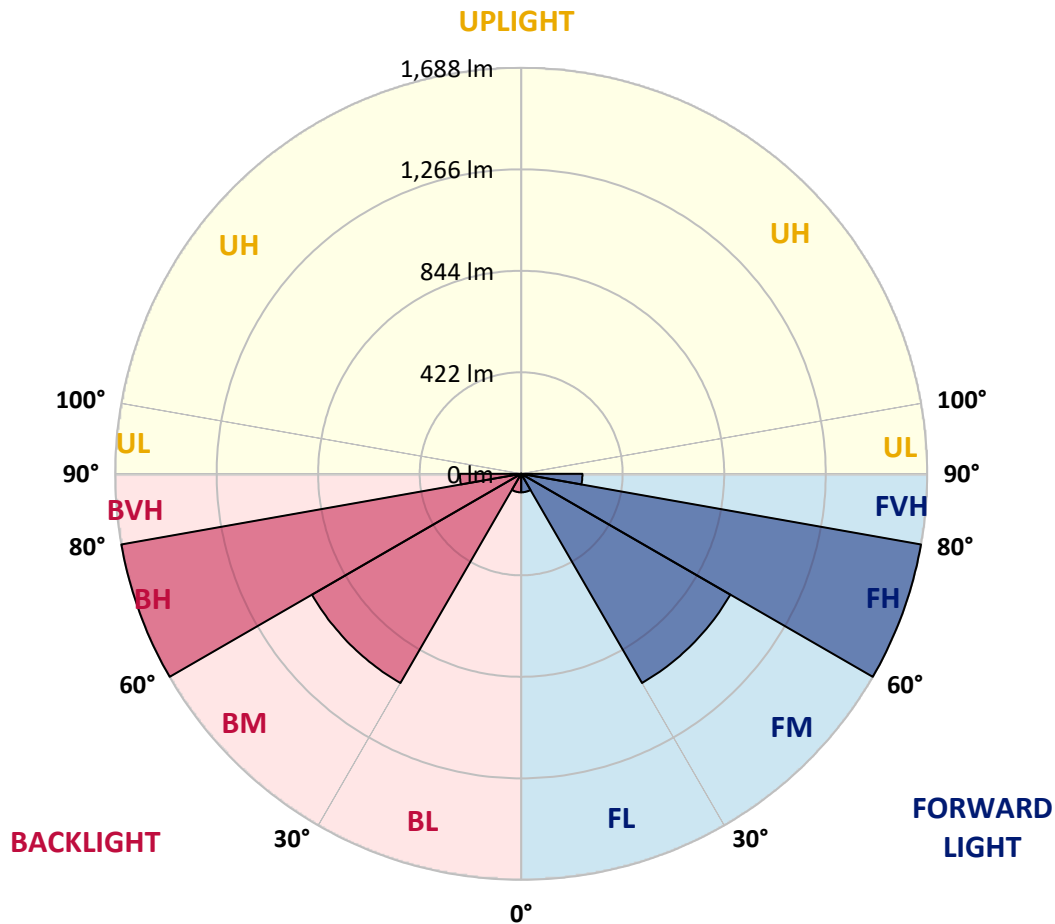
CATALOG NUMBER: TT-D4-750-U-RW-PM

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 77.2   | 1.3       |                         |      |         |
| FM   | (30°-60°)   | 1004.6 | 16.6      |                         |      |         |
| FH   | (60°-80°)   | 1688.5 | 27.9      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 254.7  | 4.2       |                         |      | G3/500  |
| BL   | (0°-30°)    | 77.2   | 1.3       | B0/110                  |      |         |
| BM   | (30°-60°)   | 1004.6 | 16.6      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 1688.5 | 27.9      | B3/2500                 |      | G3/2500 |
| BVH  | (80°-90°)   | 254.7  | 4.2       |                         |      | G3/500  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G3**

Type IV Short



REPORT NUMBER: P413324

CATALOG NUMBER: TT-D4-750-U-RW-PM

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 110.5  | 110.5  | 110.5  | 110.5  | 110.5  | 110.5  | 110.5  | 110.5  | 110.5  | 110.5  | 110.5  |
| 2.5°  | 112.0  | 112.0  | 113.4  | 113.4  | 113.4  | 113.4  | 113.4  | 113.4  | 113.4  | 113.4  | 113.4  |
| 5°    | 116.3  | 116.3  | 116.3  | 116.3  | 117.7  | 117.7  | 116.3  | 116.3  | 116.3  | 116.3  | 116.3  |
| 7.5°  | 123.5  | 122.0  | 123.5  | 123.5  | 123.5  | 122.0  | 122.0  | 122.0  | 120.6  | 120.6  | 120.6  |
| 10°   | 130.6  | 130.6  | 132.1  | 130.6  | 130.6  | 129.2  | 129.2  | 129.2  | 127.8  | 127.8  | 127.8  |
| 12.5° | 140.7  | 140.7  | 140.7  | 140.7  | 139.2  | 139.2  | 137.8  | 136.4  | 134.9  | 134.9  | 134.9  |
| 15°   | 153.6  | 152.2  | 152.2  | 150.7  | 149.3  | 147.9  | 146.4  | 146.4  | 145.0  | 145.0  | 145.0  |
| 17.5° | 166.5  | 166.5  | 165.1  | 163.6  | 160.8  | 159.3  | 159.3  | 157.9  | 156.5  | 156.5  | 156.5  |
| 20°   | 182.3  | 182.3  | 180.9  | 178.0  | 175.1  | 173.7  | 172.3  | 172.3  | 170.8  | 170.8  | 170.8  |
| 22.5° | 201.0  | 199.5  | 196.7  | 193.8  | 190.9  | 189.5  | 188.1  | 186.6  | 186.6  | 186.6  | 186.6  |
| 25°   | 221.1  | 219.6  | 218.2  | 213.9  | 209.6  | 208.1  | 205.3  | 205.3  | 203.8  | 205.3  | 205.3  |
| 27.5° | 245.5  | 244.0  | 241.2  | 236.9  | 231.1  | 228.2  | 226.8  | 226.8  | 228.2  | 228.2  | 229.7  |
| 30°   | 275.6  | 272.7  | 269.9  | 264.1  | 258.4  | 254.1  | 254.1  | 255.5  | 259.8  | 262.7  | 262.7  |
| 32.5° | 311.5  | 310.1  | 305.8  | 300.0  | 290.0  | 287.1  | 290.0  | 298.6  | 304.3  | 308.6  | 311.5  |
| 35°   | 353.1  | 351.7  | 346.0  | 335.9  | 328.7  | 327.3  | 335.9  | 350.3  | 368.9  | 374.7  | 377.5  |
| 37.5° | 399.1  | 400.5  | 393.3  | 381.8  | 374.7  | 377.5  | 394.8  | 422.0  | 440.7  | 453.6  | 456.5  |
| 40°   | 456.5  | 459.4  | 450.8  | 437.8  | 430.7  | 442.1  | 469.4  | 501.0  | 534.0  | 549.8  | 554.1  |
| 42.5° | 524.0  | 528.3  | 516.8  | 503.9  | 499.6  | 518.2  | 557.0  | 608.7  | 667.5  | 686.2  | 693.4  |
| 45°   | 607.2  | 610.1  | 595.7  | 584.3  | 581.4  | 614.4  | 680.4  | 766.6  | 859.9  | 902.9  | 910.1  |
| 47.5° | 706.3  | 704.8  | 691.9  | 677.6  | 680.4  | 727.8  | 826.9  | 943.1  | 1042.2 | 1108.2 | 1122.6 |
| 50°   | 819.7  | 812.5  | 802.5  | 785.2  | 803.9  | 872.8  | 997.7  | 1138.4 | 1304.9 | 1363.7 | 1389.6 |
| 52.5° | 933.1  | 920.2  | 911.5  | 900.1  | 933.1  | 1022.1 | 1197.2 | 1442.7 | 1693.9 | 1828.8 | 1856.1 |
| 55°   | 1035.0 | 1025.0 | 1020.6 | 1022.1 | 1073.8 | 1201.5 | 1431.2 | 1745.6 | 1988.2 | 2100.2 | 2120.3 |
| 57.5° | 1135.5 | 1129.7 | 1125.4 | 1134.1 | 1215.9 | 1382.4 | 1640.8 | 1935.1 | 2134.6 | 2217.9 | 2232.2 |
| 60°   | 1230.2 | 1236.0 | 1233.1 | 1258.9 | 1358.0 | 1525.9 | 1749.9 | 2039.9 | 2232.2 | 2308.3 | 2324.1 |
| 62.5° | 1335.0 | 1339.3 | 1339.3 | 1368.0 | 1448.4 | 1596.3 | 1824.5 | 2163.3 | 2407.4 | 2519.3 | 2536.5 |
| 65°   | 1425.5 | 1428.3 | 1434.1 | 1435.5 | 1510.2 | 1658.0 | 1956.6 | 2276.7 | 2494.9 | 2624.1 | 2635.6 |
| 67.5° | 1492.9 | 1495.8 | 1488.6 | 1481.4 | 1538.9 | 1672.4 | 1946.6 | 2262.4 | 2456.2 | 2553.8 | 2562.4 |
| 70°   | 1547.5 | 1534.6 | 1514.5 | 1478.6 | 1497.2 | 1597.7 | 1863.3 | 2147.5 | 2342.8 | 2430.3 | 2443.2 |
| 72.5° | 1554.7 | 1543.2 | 1480.0 | 1399.6 | 1376.7 | 1464.2 | 1716.9 | 1972.4 | 2140.3 | 2223.6 | 2225.0 |
| 75°   | 1511.6 | 1481.4 | 1376.7 | 1256.1 | 1213.0 | 1296.3 | 1513.0 | 1745.6 | 1880.5 | 1950.9 | 1958.0 |
| 77.5° | 1366.6 | 1337.9 | 1205.8 | 1068.0 | 1019.2 | 1091.0 | 1274.7 | 1462.8 | 1592.0 | 1660.9 | 1665.2 |
| 80°   | 1109.7 | 1099.6 | 979.0  | 852.7  | 793.8  | 835.5  | 996.2  | 1144.1 | 1248.9 | 1330.7 | 1337.9 |
| 82.5° | 818.2  | 809.6  | 717.8  | 607.2  | 559.8  | 594.3  | 709.1  | 818.2  | 915.9  | 981.9  | 986.2  |
| 85°   | 511.0  | 493.8  | 436.4  | 358.9  | 327.3  | 350.3  | 426.3  | 499.6  | 587.1  | 638.8  | 641.7  |
| 87.5° | 170.8  | 163.6  | 140.7  | 116.3  | 97.6   | 101.9  | 124.9  | 152.2  | 222.5  | 245.5  | 259.8  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

McGRAW-EDISON

Report Number: SP1-2006-844-1

Luminaire Tested: TT-D4-750-U-WQ

Data valid for TT-D\* and TTN families of products

Test Date: 11/06/2020

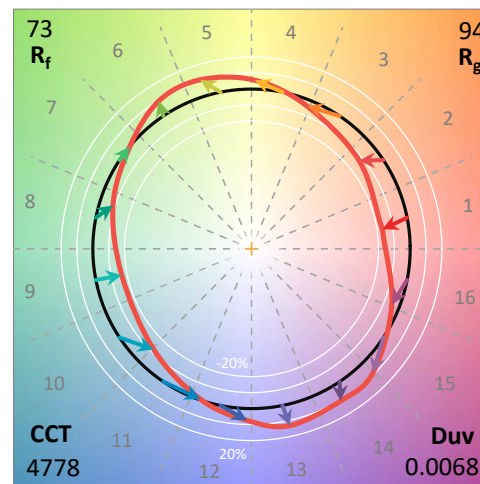
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2006-844-1  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 11/06/2020  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **TT-D4-750-U-WQ**  
 Description: MCGRAW EDISON

### DISTRIBUTION

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4778   | CRI (Ra): | 71.0 |      |       |
| CIE u':                   | 0.2092 | R1:       | 67.7 | R9:  | -28.7 |
| CIE v':                   | 0.4955 | R2:       | 75.2 | R10: | 41.2  |
| Duv:                      | 0.0068 | R3:       | 80.8 | R11: | 67.2  |
| CIE x:                    | 0.3535 | R4:       | 71.5 | R12: | 35.9  |
| CIE y:                    | 0.3721 | R5:       | 67.8 | R13: | 68.5  |
| CIE z:                    | 0.2744 | R6:       | 65.6 | R14: | 89.2  |
| Peak Wavelength (nm):     | 449    | R7:       | 82.2 |      |       |
| Dominant Wavelength (nm): | 570    | R8:       | 57.2 |      |       |
| Purity:                   | 17.8   |           |      |      |       |
| Rf:                       | 73.3   |           |      |      |       |
| Rg:                       | 94.5   |           |      |      |       |



### Test Conditions

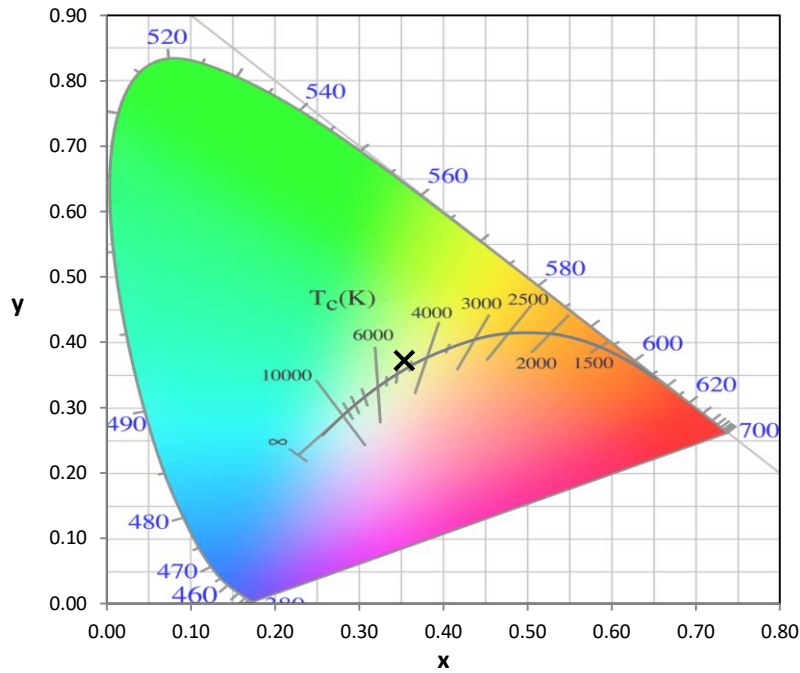
Stabilization Time: 62M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/45%  
 Sphere Temperature (°C): 24.7

REPORT NUMBER: SP1-2006-844-1

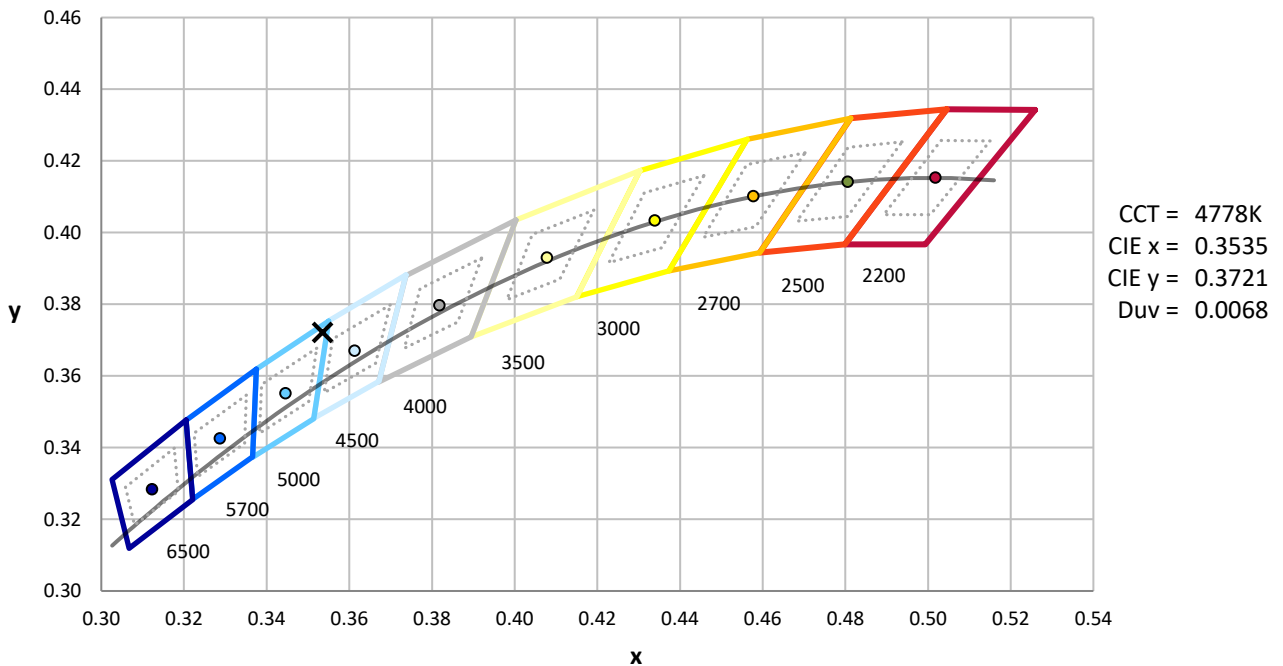
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 7/29/2020        | 1/29/2021            |
| Power Meter                    | IN0071                | 12/3/2019        | 12/3/2020            |
| AC Power Source                | IN0063                | 12/3/2019        | 12/3/2020            |
| DC Power Source                | IN0208                | 12/3/2019        | 12/3/2020            |
| Sphere Thermometer             | IN0085                | 12/3/2019        | 12/3/2020            |
| Room Thermometer               | IN0046                | 12/3/2019        | 12/3/2020            |

REPORT NUMBER: SP1-2006-844-1

**CIE 1931 Chromaticity Diagram**



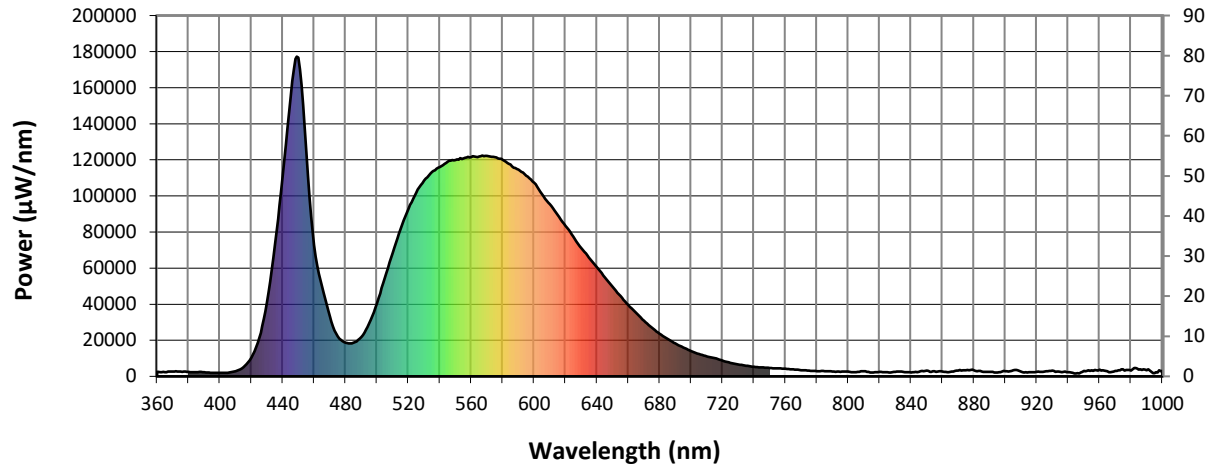
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 7-step quadrangle

REPORT NUMBER: SP1-2006-844-1

### Photopic Flux vs. Wavelength

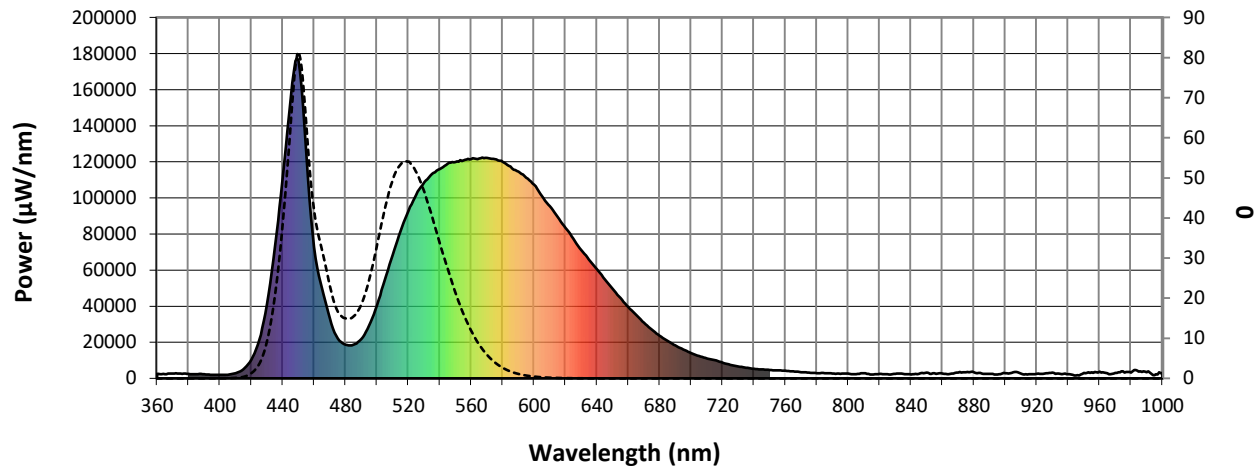


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2529             | 0.0              | 490       | 21819            | 3.1              | 620       | 83437            | 21.7             | 750       | 4608             | 0.0              | 880       | 3335             | 0.0              |
| 365       | 2361             | 0.0              | 495       | 29270            | 5.3              | 625       | 77569            | 17.1             | 755       | 4412             | 0.0              | 885       | 2653             | 0.0              |
| 370       | 2648             | 0.0              | 500       | 40589            | 9.0              | 630       | 71183            | 12.9             | 760       | 4227             | 0.0              | 890       | 2411             | 0.0              |
| 375       | 2655             | 0.0              | 505       | 54498            | 15.2             | 635       | 65734            | 9.9              | 765       | 3922             | 0.0              | 895       | 2118             | 0.0              |
| 380       | 2428             | 0.0              | 510       | 68399            | 23.5             | 640       | 60418            | 7.2              | 770       | 3461             | 0.0              | 900       | 2873             | 0.0              |
| 385       | 2334             | 0.0              | 515       | 81428            | 33.7             | 645       | 54736            | 5.3              | 775       | 3226             | 0.0              | 905       | 3367             | 0.0              |
| 390       | 2269             | 0.0              | 520       | 92826            | 45.0             | 650       | 49620            | 3.6              | 780       | 2883             | 0.0              | 910       | 2749             | 0.0              |
| 395       | 2020             | 0.0              | 525       | 101684           | 54.6             | 655       | 44517            | 2.6              | 785       | 2864             | 0.0              | 915       | 2283             | 0.0              |
| 400       | 1873             | 0.0              | 530       | 108580           | 63.9             | 660       | 39493            | 1.6              | 790       | 2715             | 0.0              | 920       | 2425             | 0.0              |
| 405       | 2015             | 0.0              | 535       | 113290           | 70.3             | 665       | 35066            | 1.1              | 795       | 2547             | 0.0              | 925       | 2705             | 0.0              |
| 410       | 2831             | 0.0              | 540       | 116042           | 75.6             | 670       | 30825            | 0.7              | 800       | 2585             | 0.0              | 930       | 3144             | 0.0              |
| 415       | 5121             | 0.0              | 545       | 118948           | 79.2             | 675       | 27031            | 0.5              | 805       | 2308             | 0.0              | 935       | 2539             | 0.0              |
| 420       | 10348            | 0.0              | 550       | 119916           | 81.5             | 680       | 23555            | 0.3              | 810       | 2796             | 0.0              | 940       | 2288             | 0.0              |
| 425       | 21288            | 0.1              | 555       | 120734           | 82.5             | 685       | 20841            | 0.2              | 815       | 2196             | 0.0              | 945       | 1604             | 0.0              |
| 430       | 41173            | 0.3              | 560       | 121523           | 82.6             | 690       | 18232            | 0.1              | 820       | 2415             | 0.0              | 950       | 3031             | 0.0              |
| 435       | 73003            | 0.9              | 565       | 121859           | 81.0             | 695       | 16035            | 0.1              | 825       | 2281             | 0.0              | 955       | 3356             | 0.0              |
| 440       | 111013           | 1.7              | 570       | 122246           | 79.5             | 700       | 14010            | 0.0              | 830       | 2524             | 0.0              | 960       | 3704             | 0.0              |
| 445       | 154787           | 3.2              | 575       | 121449           | 75.6             | 705       | 12408            | 0.0              | 835       | 2461             | 0.0              | 965       | 2847             | 0.0              |
| 450       | 176733           | 4.6              | 580       | 120111           | 71.4             | 710       | 11063            | 0.0              | 840       | 2195             | 0.0              | 970       | 2985             | 0.0              |
| 455       | 124334           | 4.2              | 585       | 117354           | 65.2             | 715       | 10136            | 0.0              | 845       | 2487             | 0.0              | 975       | 3963             | 0.0              |
| 460       | 72664            | 3.0              | 590       | 114565           | 59.2             | 720       | 8693             | 0.0              | 850       | 3144             | 0.0              | 980       | 3221             | 0.0              |
| 465       | 49806            | 2.6              | 595       | 111127           | 52.7             | 725       | 7522             | 0.0              | 855       | 2809             | 0.0              | 985       | 3794             | 0.0              |
| 470       | 32995            | 2.1              | 600       | 107253           | 46.2             | 730       | 6612             | 0.0              | 860       | 2621             | 0.0              | 990       | 3296             | 0.0              |
| 475       | 22184            | 1.7              | 605       | 101156           | 39.2             | 735       | 5947             | 0.0              | 865       | 2410             | 0.0              | 995       | 1779             | 0.0              |
| 480       | 18691            | 1.8              | 610       | 95370            | 32.8             | 740       | 5253             | 0.0              | 870       | 3143             | 0.0              | 1000      | 2977             | 0.0              |
| 485       | 18593            | 2.2              | 615       | 89556            | 27.0             | 745       | 5032             | 0.0              | 875       | 3421             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2006-844-1

### Scotopic Flux vs. Wavelength



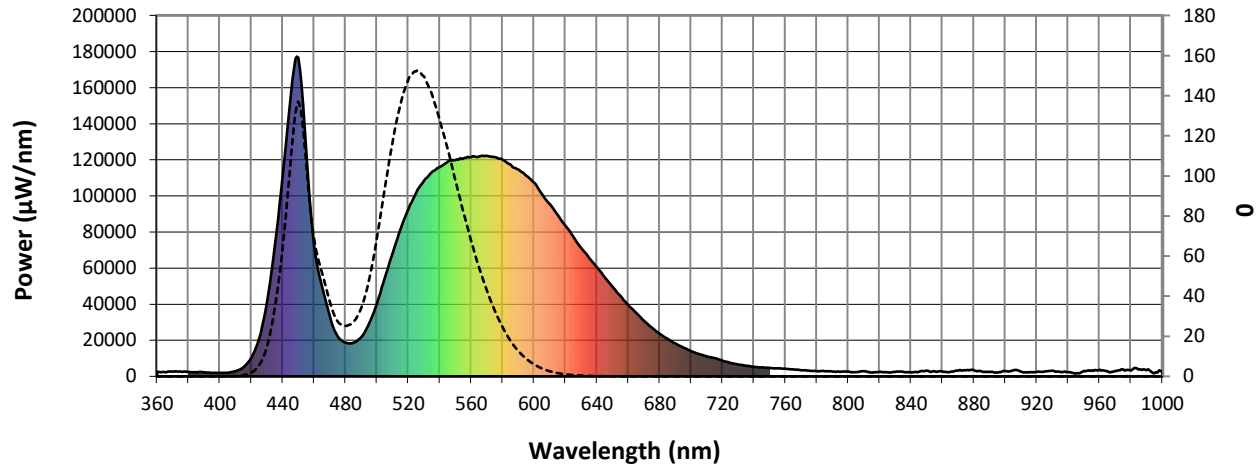
Scotopic Lumens: 4867.6

S/P: 0.66

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W/nm}$ ) | Lumens<br>( $\Phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 2529                          | 0.0                            | 490               | 21819                         | 33.6                           | 620               | 83437                         | 1.0                            | 750               | 4608                          | 0.0                            | 880               | 3335                          | 0.0                            |
| 365               | 2361                          | 0.0                            | 495               | 29270                         | 47.3                           | 625               | 77569                         | 0.7                            | 755               | 4412                          | 0.0                            | 885               | 2653                          | 0.0                            |
| 370               | 2648                          | 0.0                            | 500               | 40589                         | 67.9                           | 630               | 71183                         | 0.4                            | 760               | 4227                          | 0.0                            | 890               | 2411                          | 0.0                            |
| 375               | 2655                          | 0.0                            | 505               | 54498                         | 92.6                           | 635               | 65734                         | 0.2                            | 765               | 3922                          | 0.0                            | 895               | 2118                          | 0.0                            |
| 380               | 2428                          | 0.0                            | 510               | 68399                         | 115.9                          | 640               | 60418                         | 0.2                            | 770               | 3461                          | 0.0                            | 900               | 2873                          | 0.0                            |
| 385               | 2334                          | 0.0                            | 515               | 81428                         | 135.0                          | 645               | 54736                         | 0.1                            | 775               | 3226                          | 0.0                            | 905               | 3367                          | 0.0                            |
| 390               | 2269                          | 0.0                            | 520               | 92826                         | 147.5                          | 650               | 49620                         | 0.1                            | 780               | 2883                          | 0.0                            | 910               | 2749                          | 0.0                            |
| 395               | 2020                          | 0.0                            | 525               | 101684                        | 152.1                          | 655               | 44517                         | 0.0                            | 785               | 2864                          | 0.0                            | 915               | 2283                          | 0.0                            |
| 400               | 1873                          | 0.0                            | 530               | 108580                        | 149.7                          | 660               | 39493                         | 0.0                            | 790               | 2715                          | 0.0                            | 920               | 2425                          | 0.0                            |
| 405               | 2015                          | 0.1                            | 535               | 113290                        | 141.2                          | 665               | 35066                         | 0.0                            | 795               | 2547                          | 0.0                            | 925               | 2705                          | 0.0                            |
| 410               | 2831                          | 0.2                            | 540               | 116042                        | 128.2                          | 670               | 30825                         | 0.0                            | 800               | 2585                          | 0.0                            | 930               | 3144                          | 0.0                            |
| 415               | 5121                          | 0.5                            | 545               | 118948                        | 114.0                          | 675               | 27031                         | 0.0                            | 805               | 2308                          | 0.0                            | 935               | 2539                          | 0.0                            |
| 420               | 10348                         | 1.7                            | 550               | 119916                        | 98.1                           | 680               | 23555                         | 0.0                            | 810               | 2796                          | 0.0                            | 940               | 2288                          | 0.0                            |
| 425               | 21288                         | 5.2                            | 555               | 120734                        | 82.5                           | 685               | 20841                         | 0.0                            | 815               | 2196                          | 0.0                            | 945               | 1604                          | 0.0                            |
| 430               | 41173                         | 14.0                           | 560               | 121523                        | 67.9                           | 690               | 18232                         | 0.0                            | 820               | 2415                          | 0.0                            | 950               | 3031                          | 0.0                            |
| 435               | 73003                         | 32.6                           | 565               | 121859                        | 54.7                           | 695               | 16035                         | 0.0                            | 825               | 2281                          | 0.0                            | 955               | 3356                          | 0.0                            |
| 440               | 111013                        | 62.0                           | 570               | 122246                        | 43.1                           | 700               | 14010                         | 0.0                            | 830               | 2524                          | 0.0                            | 960               | 3704                          | 0.0                            |
| 445               | 154787                        | 103.6                          | 575               | 121449                        | 33.1                           | 705               | 12408                         | 0.0                            | 835               | 2461                          | 0.0                            | 965               | 2847                          | 0.0                            |
| 450               | 176733                        | 137.0                          | 580               | 120111                        | 24.7                           | 710               | 11063                         | 0.0                            | 840               | 2195                          | 0.0                            | 970               | 2985                          | 0.0                            |
| 455               | 124334                        | 108.6                          | 585               | 117354                        | 17.9                           | 715               | 10136                         | 0.0                            | 845               | 2487                          | 0.0                            | 975               | 3963                          | 0.0                            |
| 460               | 72664                         | 70.2                           | 590               | 114565                        | 12.8                           | 720               | 8693                          | 0.0                            | 850               | 3144                          | 0.0                            | 980               | 3221                          | 0.0                            |
| 465               | 49806                         | 52.6                           | 595               | 111127                        | 8.9                            | 725               | 7522                          | 0.0                            | 855               | 2809                          | 0.0                            | 985               | 3794                          | 0.0                            |
| 470               | 32995                         | 38.0                           | 600               | 107253                        | 6.0                            | 730               | 6612                          | 0.0                            | 860               | 2621                          | 0.0                            | 990               | 3296                          | 0.0                            |
| 475               | 22184                         | 27.7                           | 605               | 101156                        | 4.0                            | 735               | 5947                          | 0.0                            | 865               | 2410                          | 0.0                            | 995               | 1779                          | 0.0                            |
| 480               | 18691                         | 25.2                           | 610               | 95370                         | 2.6                            | 740               | 5253                          | 0.0                            | 870               | 3143                          | 0.0                            | 1000              | 2977                          | 0.0                            |
| 485               | 18593                         | 27.0                           | 615               | 89556                         | 1.7                            | 745               | 5032                          | 0.0                            | 875               | 3421                          | 0.0                            |                   |                               |                                |

REPORT NUMBER: SP1-2006-844-1

### Melanopic Flux vs. Wavelength



Melanopic Lumens: 12457.9 S/P: 1.7

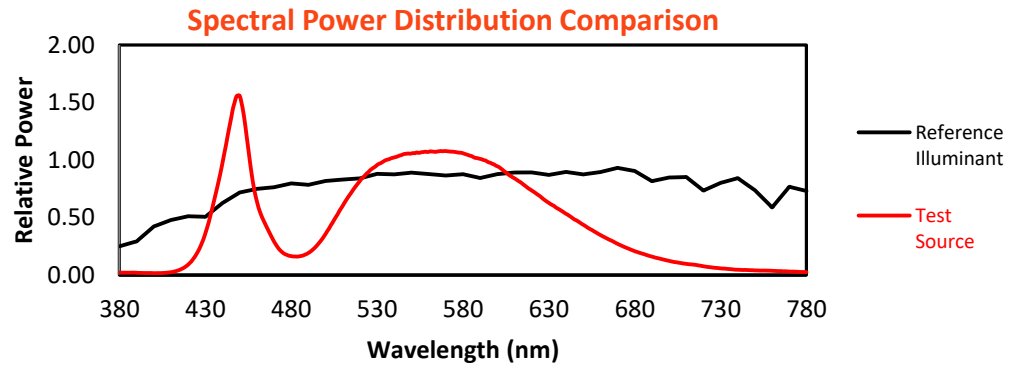
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2529             | 0.0              | 490       | 21819            | 18.2             | 620       | 83437            | 0.1              | 750       | 4608             | 0.0              | 880       | 3335             | 0.0              |
| 365       | 2361             | 0.0              | 495       | 29270            | 24.2             | 625       | 77569            | 0.0              | 755       | 4412             | 0.0              | 885       | 2653             | 0.0              |
| 370       | 2648             | 0.0              | 500       | 40589            | 32.6             | 630       | 71183            | 0.0              | 760       | 4227             | 0.0              | 890       | 2411             | 0.0              |
| 375       | 2655             | 0.0              | 505       | 54498            | 41.8             | 635       | 65734            | 0.0              | 765       | 3922             | 0.0              | 895       | 2118             | 0.0              |
| 380       | 2428             | 0.0              | 510       | 68399            | 49.1             | 640       | 60418            | 0.0              | 770       | 3461             | 0.0              | 900       | 2873             | 0.0              |
| 385       | 2334             | 0.0              | 515       | 81428            | 53.2             | 645       | 54736            | 0.0              | 775       | 3226             | 0.0              | 905       | 3367             | 0.0              |
| 390       | 2269             | 0.0              | 520       | 92826            | 54.0             | 650       | 49620            | 0.0              | 780       | 2883             | 0.0              | 910       | 2749             | 0.0              |
| 395       | 2020             | 0.0              | 525       | 101684           | 51.6             | 655       | 44517            | 0.0              | 785       | 2864             | 0.0              | 915       | 2283             | 0.0              |
| 400       | 1873             | 0.0              | 530       | 108580           | 46.9             | 660       | 39493            | 0.0              | 790       | 2715             | 0.0              | 920       | 2425             | 0.0              |
| 405       | 2015             | 0.0              | 535       | 113290           | 40.8             | 665       | 35066            | 0.0              | 795       | 2547             | 0.0              | 925       | 2705             | 0.0              |
| 410       | 2831             | 0.1              | 540       | 116042           | 34.0             | 670       | 30825            | 0.0              | 800       | 2585             | 0.0              | 930       | 3144             | 0.0              |
| 415       | 5121             | 0.3              | 545       | 118948           | 27.6             | 675       | 27031            | 0.0              | 805       | 2308             | 0.0              | 935       | 2539             | 0.0              |
| 420       | 10348            | 1.2              | 550       | 119916           | 21.5             | 680       | 23555            | 0.0              | 810       | 2796             | 0.0              | 940       | 2288             | 0.0              |
| 425       | 21288            | 3.3              | 555       | 120734           | 16.3             | 685       | 20841            | 0.0              | 815       | 2196             | 0.0              | 945       | 1604             | 0.0              |
| 430       | 41173            | 8.7              | 560       | 121523           | 12.0             | 690       | 18232            | 0.0              | 820       | 2415             | 0.0              | 950       | 3031             | 0.0              |
| 435       | 73003            | 19.5             | 565       | 121859           | 8.6              | 695       | 16035            | 0.0              | 825       | 2281             | 0.0              | 955       | 3356             | 0.0              |
| 440       | 111013           | 37.1             | 570       | 122246           | 6.0              | 700       | 14010            | 0.0              | 830       | 2524             | 0.0              | 960       | 3704             | 0.0              |
| 445       | 154787           | 61.1             | 575       | 121449           | 4.0              | 705       | 12408            | 0.0              | 835       | 2461             | 0.0              | 965       | 2847             | 0.0              |
| 450       | 176733           | 81.4             | 580       | 120111           | 2.7              | 710       | 11063            | 0.0              | 840       | 2195             | 0.0              | 970       | 2985             | 0.0              |
| 455       | 124334           | 65.1             | 585       | 117354           | 1.7              | 715       | 10136            | 0.0              | 845       | 2487             | 0.0              | 975       | 3963             | 0.0              |
| 460       | 72664            | 42.8             | 590       | 114565           | 1.1              | 720       | 8693             | 0.0              | 850       | 3144             | 0.0              | 980       | 3221             | 0.0              |
| 465       | 49806            | 32.5             | 595       | 111127           | 0.7              | 725       | 7522             | 0.0              | 855       | 2809             | 0.0              | 985       | 3794             | 0.0              |
| 470       | 32995            | 23.6             | 600       | 107253           | 0.5              | 730       | 6612             | 0.0              | 860       | 2621             | 0.0              | 990       | 3296             | 0.0              |
| 475       | 22184            | 16.9             | 605       | 101156           | 0.3              | 735       | 5947             | 0.0              | 865       | 2410             | 0.0              | 995       | 1779             | 0.0              |
| 480       | 18691            | 15.0             | 610       | 95370            | 0.2              | 740       | 5253             | 0.0              | 870       | 3143             | 0.0              | 1000      | 2977             | 0.0              |
| 485       | 18593            | 15.3             | 615       | 89556            | 0.1              | 745       | 5032             | 0.0              | 875       | 3421             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2006-844-1

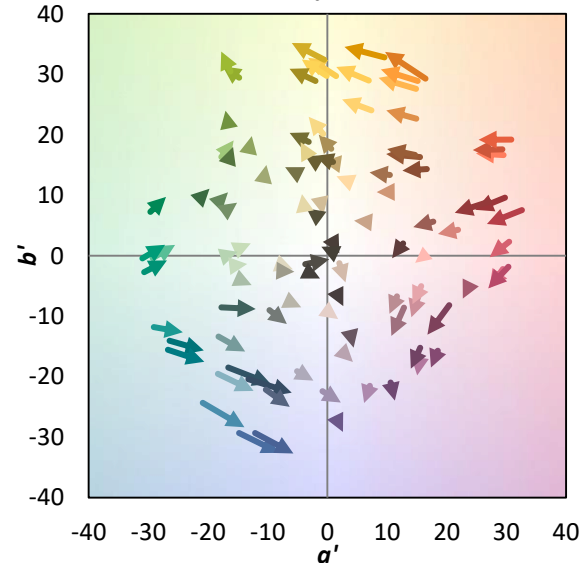
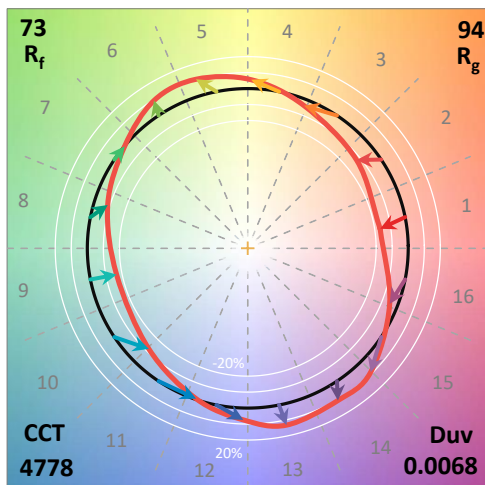
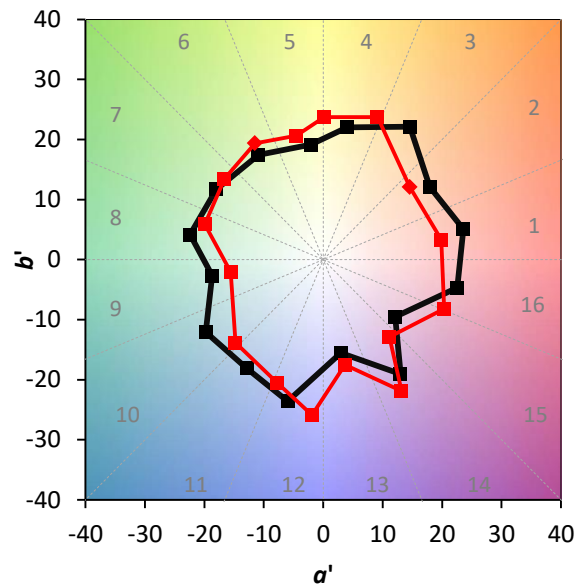
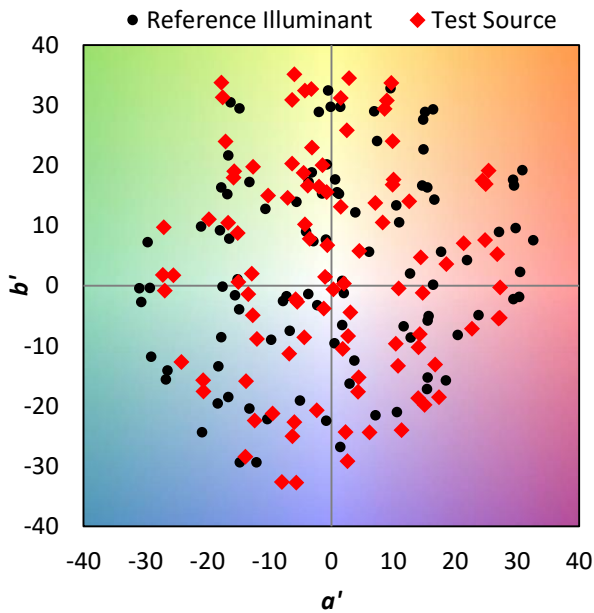
TM-30-18

### Summary

$R_f = 73.3$   
 $R_g = 94.5$   
 CIE  $R_a = 71.0$   
 $R_g = -28.7$

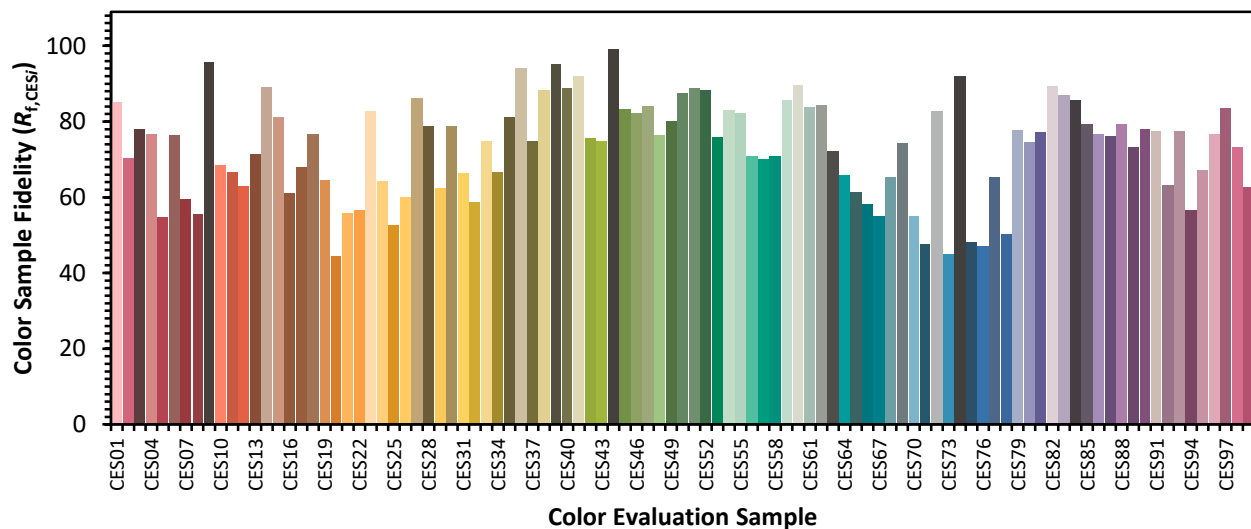


### Color Vector Graphics

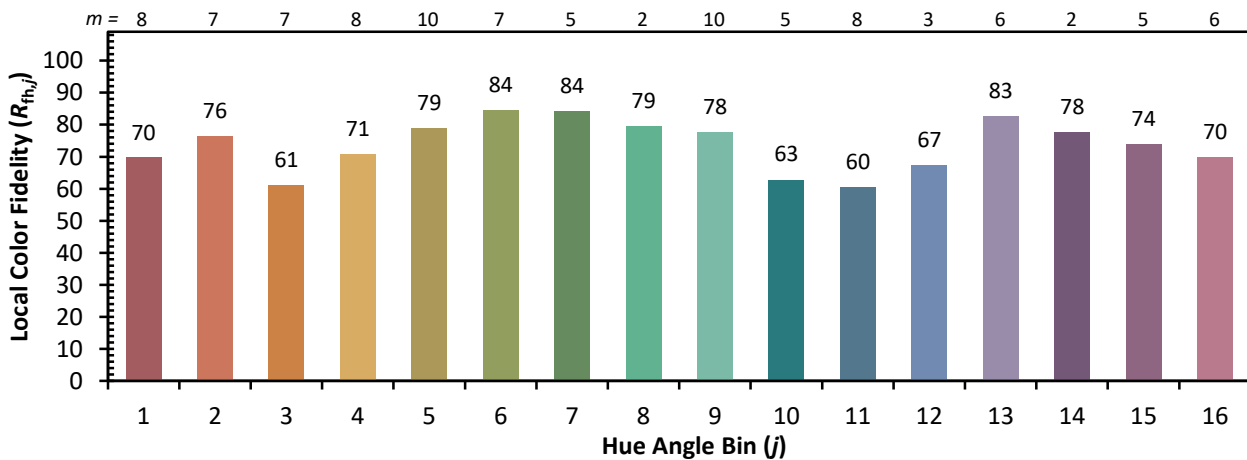
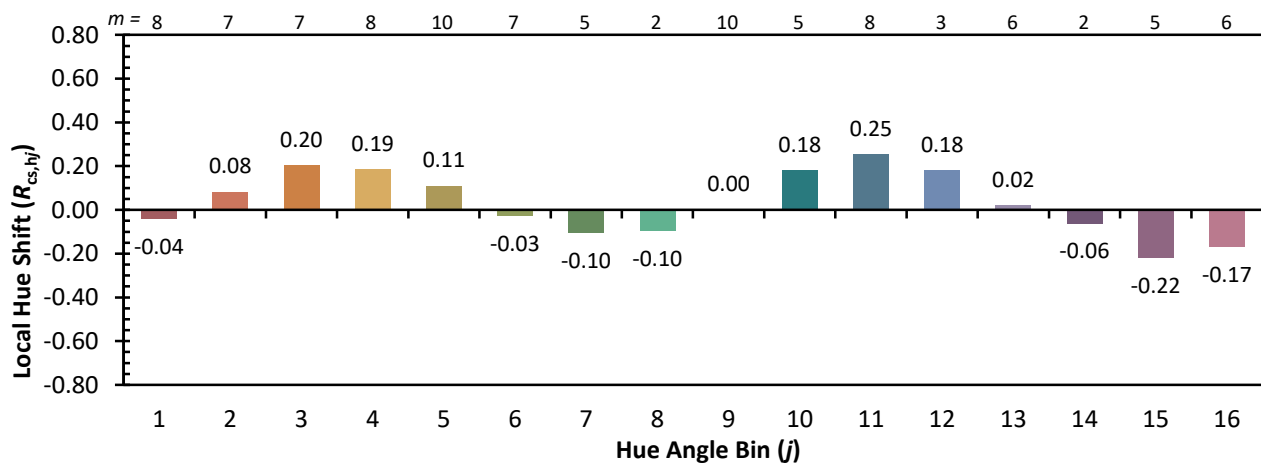
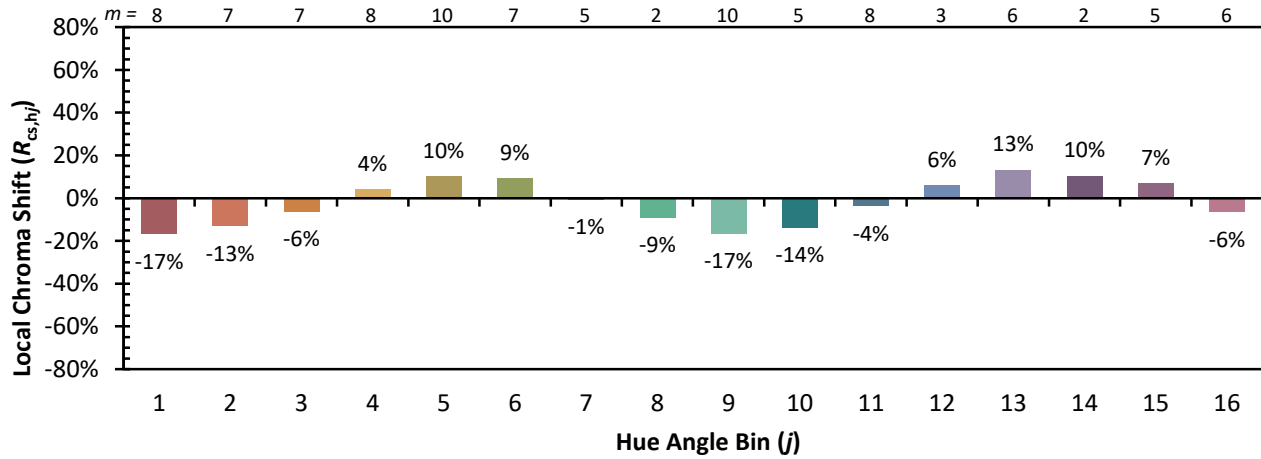


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

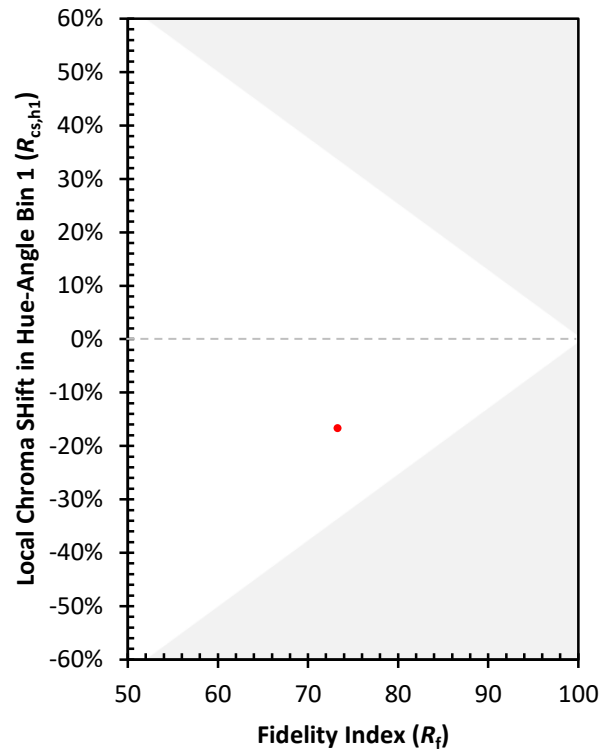
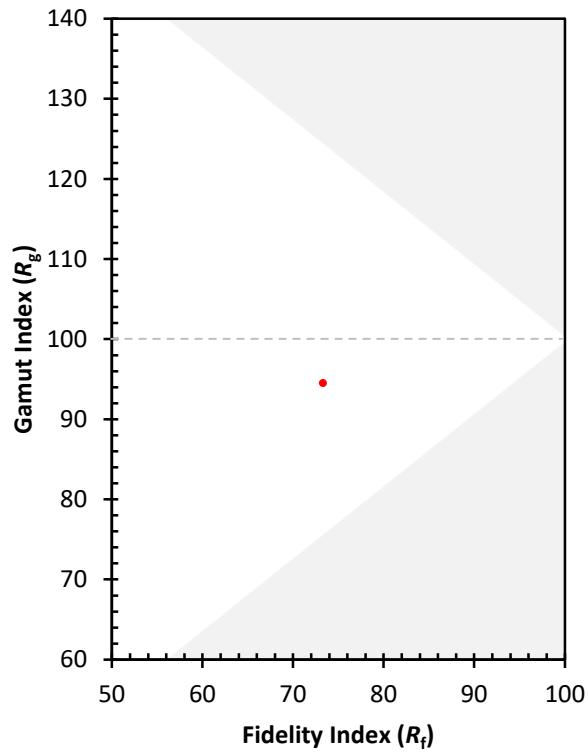
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 60 | CES51 = 89 | CES76 = 47 |
| CES02 = 59 | CES27 = 86 | CES52 = 88 | CES77 = 65 |
| CES03 = 30 | CES28 = 79 | CES53 = 76 | CES78 = 50 |
| CES04 = 69 | CES29 = 62 | CES54 = 83 | CES79 = 78 |
| CES05 = 46 | CES30 = 79 | CES55 = 82 | CES80 = 74 |
| CES06 = 50 | CES31 = 66 | CES56 = 71 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 70 | CES82 = 89 |
| CES08 = 38 | CES33 = 75 | CES58 = 71 | CES83 = 87 |
| CES09 = 29 | CES34 = 67 | CES59 = 86 | CES84 = 86 |
| CES10 = 72 | CES35 = 81 | CES60 = 90 | CES85 = 79 |
| CES11 = 56 | CES36 = 94 | CES61 = 84 | CES86 = 77 |
| CES12 = 61 | CES37 = 75 | CES62 = 84 | CES87 = 76 |
| CES13 = 41 | CES38 = 88 | CES63 = 72 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 66 | CES89 = 73 |
| CES15 = 70 | CES40 = 89 | CES65 = 61 | CES90 = 78 |
| CES16 = 46 | CES41 = 92 | CES66 = 58 | CES91 = 77 |
| CES17 = 49 | CES42 = 75 | CES67 = 55 | CES92 = 63 |
| CES18 = 55 | CES43 = 75 | CES68 = 65 | CES93 = 78 |
| CES19 = 71 | CES44 = 99 | CES69 = 74 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 55 | CES95 = 67 |
| CES21 = 85 | CES46 = 82 | CES71 = 48 | CES96 = 77 |
| CES22 = 77 | CES47 = 84 | CES72 = 83 | CES97 = 84 |
| CES23 = 91 | CES48 = 76 | CES73 = 45 | CES98 = 73 |
| CES24 = 90 | CES49 = 80 | CES74 = 92 | CES99 = 63 |
| CES25 = 71 | CES50 = 88 | CES75 = 48 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)