

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: P472225

Luminaire Tested: **CCP-VA-1-740-U-T2**

Issue Date: 01/27/2021



**Test Information**

Test Method: LM-79-08  
Report Number: P472225  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 01/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: CCP-VA-1-740-U-T2  
Description: INVUE CLEARCURVE POLE MOUNT Wave Stream LUMINAIRE WITH T2  
DISTRIBUTION LENS  
Light Source: 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2793.5 lumens  
Efficiency: N/A  
Efficacy: 93.7 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.54' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G2

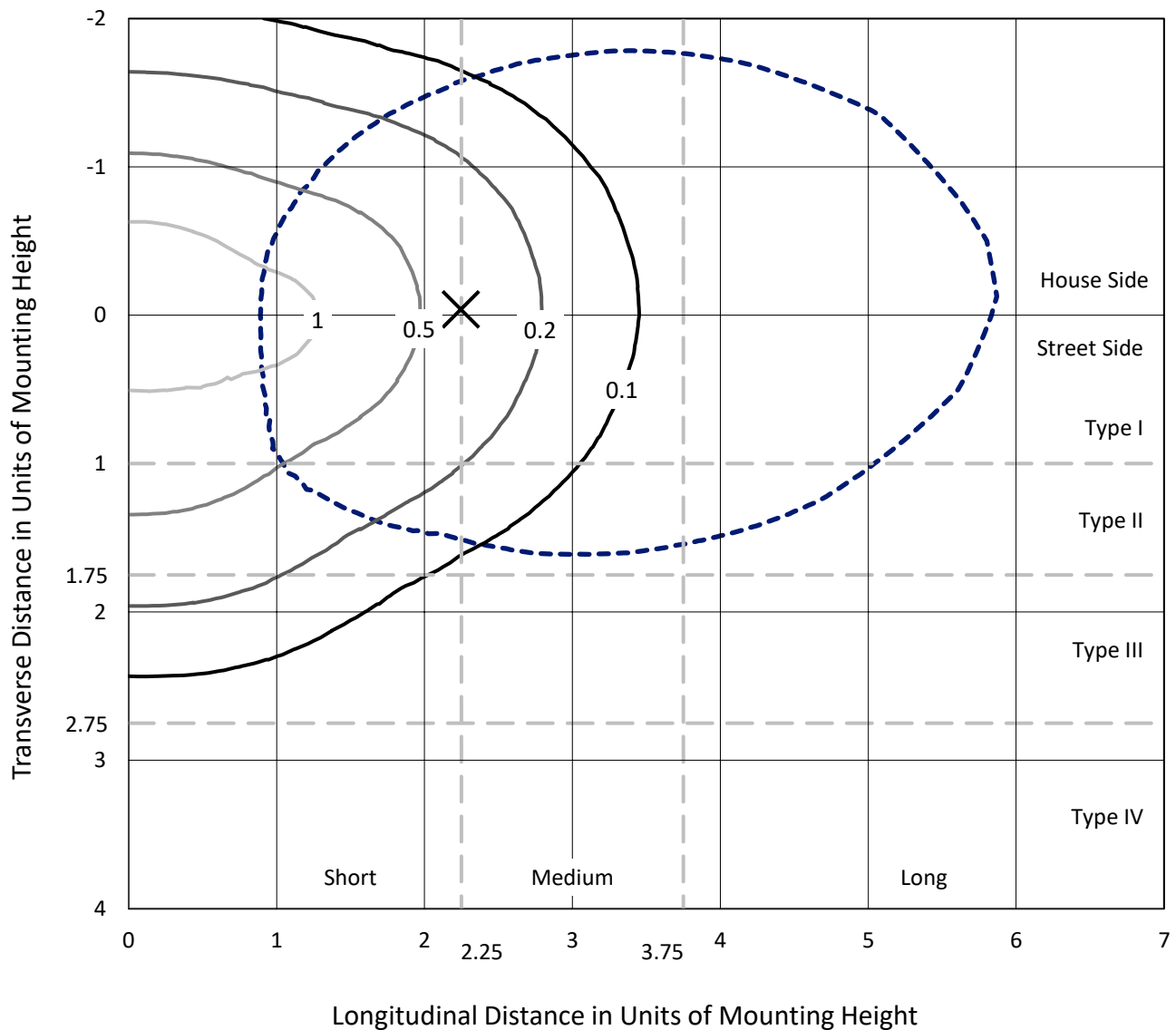
Input Watts (W): 29.8  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

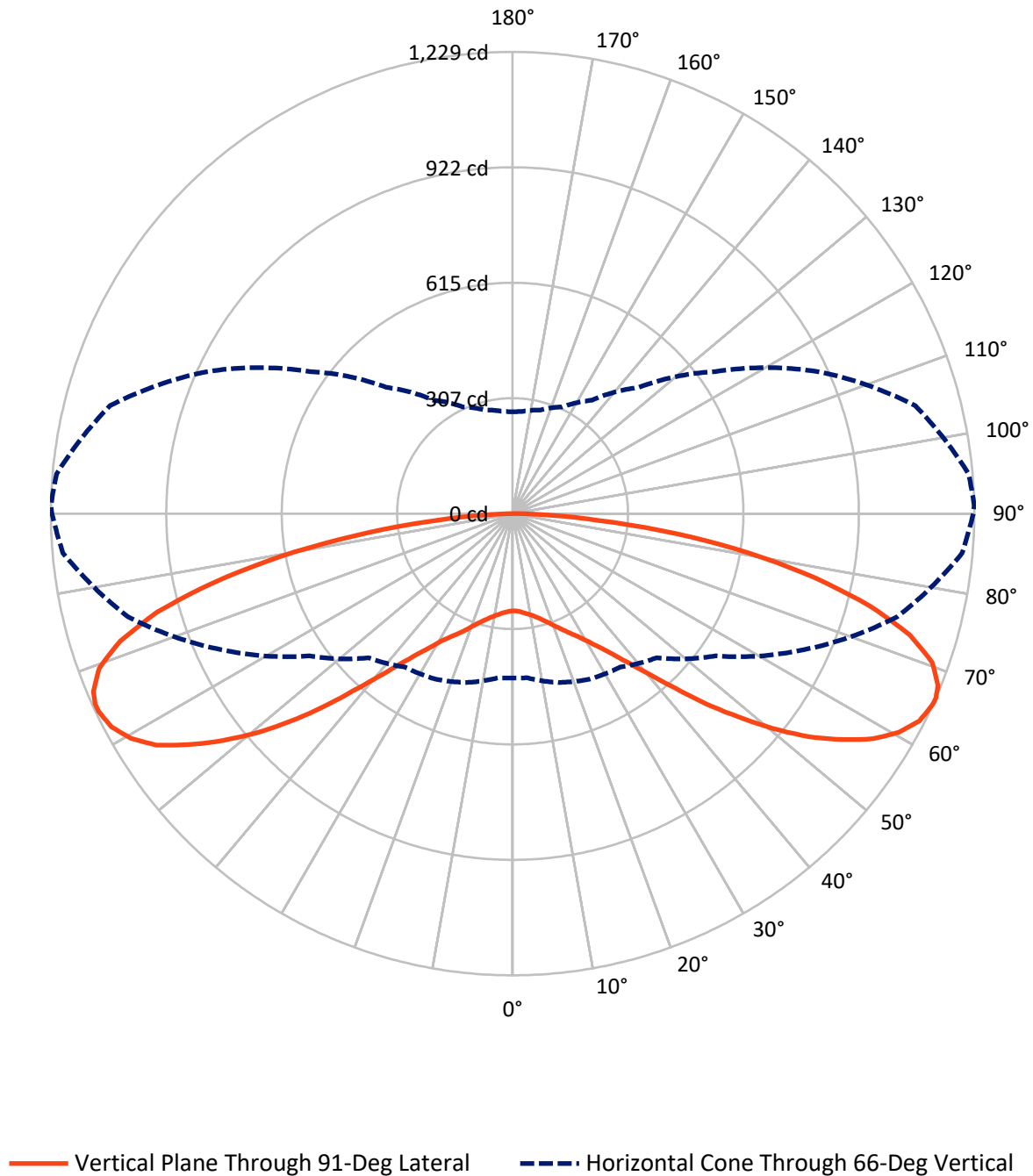
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 1.2 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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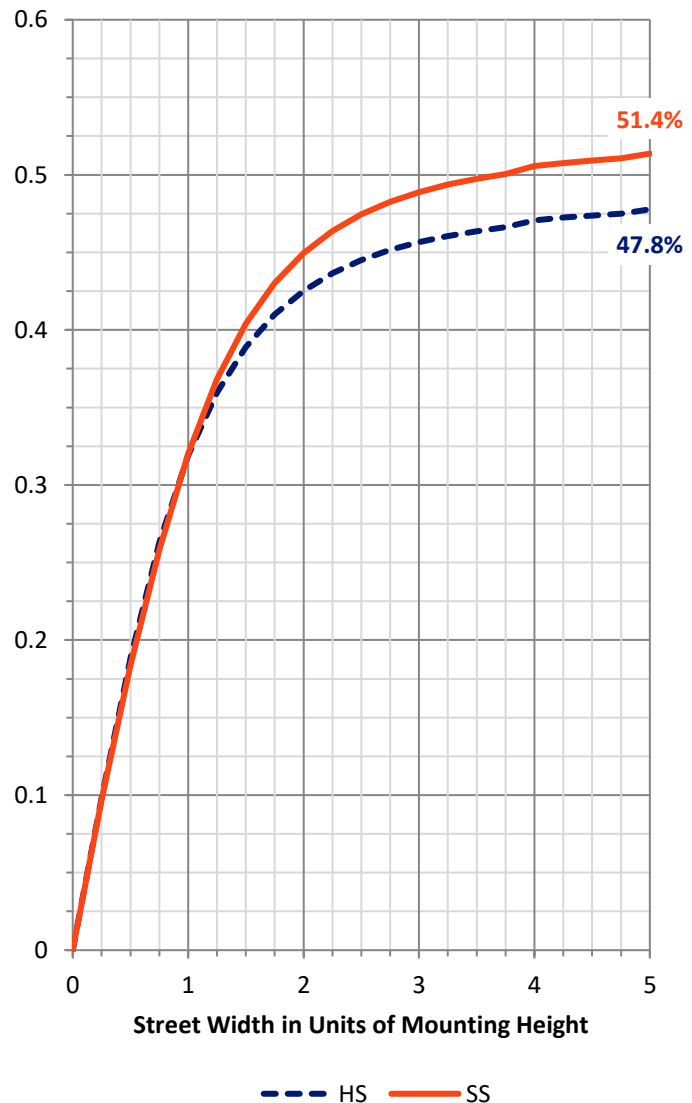
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1348.3   | 0.0    | 1348.3 |
|                    | % Fixture | 48.3     | 0.0    | 48.3   |
| <b>Street Side</b> | Lumens    | 1445.2   | 0.0    | 1445.2 |
|                    | % Fixture | 51.7     | 0.0    | 51.7   |
| <b>Total</b>       | Lumens    | 2793.5   | 0.0    | 2793.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 25.5   | 0.9       |
| 10°-20°   | 83.4   | 3.0       |
| 20°-30°   | 161.3  | 5.8       |
| 30°-40°   | 264.6  | 9.5       |
| 40°-50°   | 419.2  | 15.0      |
| 50°-60°   | 578.0  | 20.7      |
| 60°-70°   | 649.1  | 23.2      |
| 70°-80°   | 485.1  | 17.4      |
| 80°-90°   | 127.5  | 4.6       |
| 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°    | 2793.5 | 100.0     |
| 0°-180°   | 2793.5 | 100.0     |

**Coefficient of Utilization**



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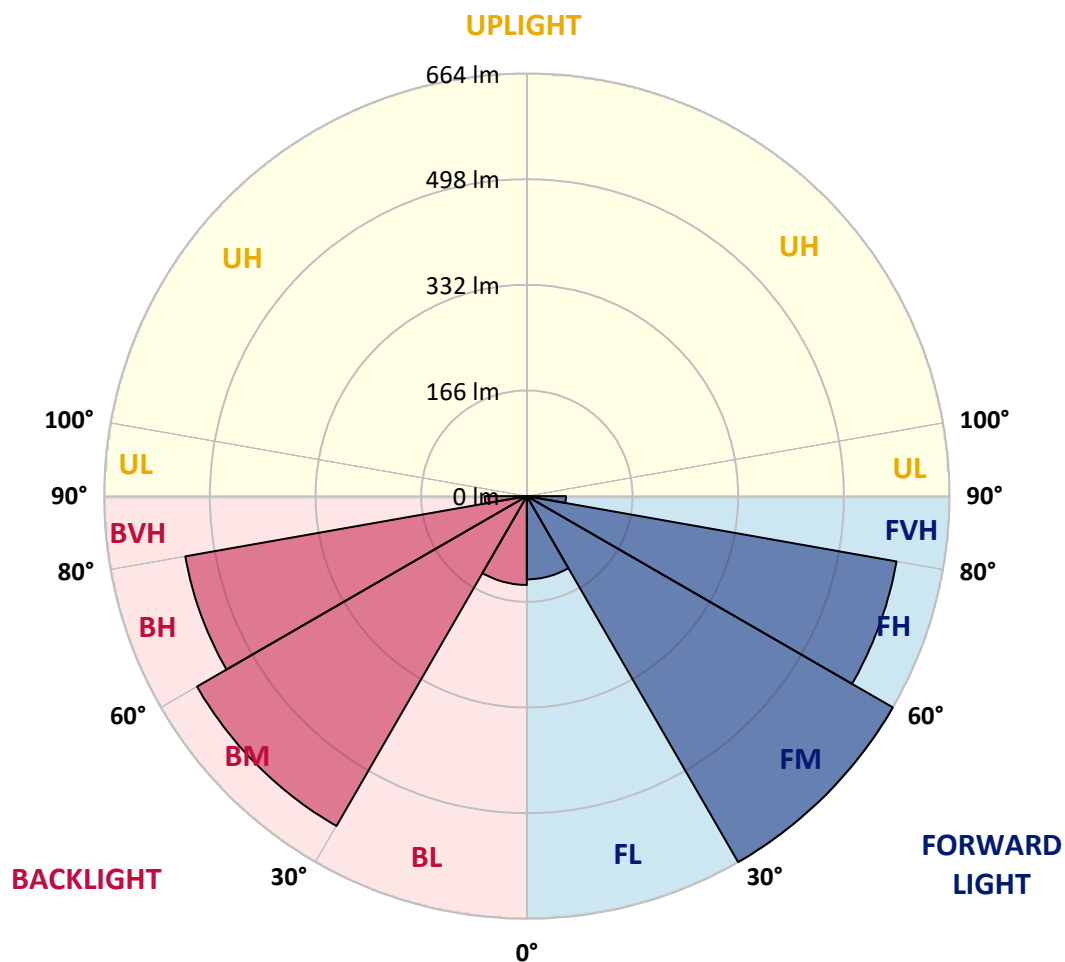
CATALOG NUMBER: CCP-VA-1-740-U-T2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 130.6  | 4.7       |                         |      |         |
| FM   | (30°-60°)   | 663.7  | 23.8      |                         |      |         |
| FH   | (60°-80°)   | 589.6  | 21.1      |                         |      | G0/660  |
| FVH  | (80°-90°)   | 61.4   | 2.2       |                         |      | G1/100  |
| BL   | (0°-30°)    | 139.5  | 5.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 598.1  | 21.4      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 544.6  | 19.5      | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 66.1   | 2.4       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 65°   | 75°    | 85°    | 90°    |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 0°    | 258.9 | 258.9 | 258.9 | 258.9 | 258.9 | 258.9 | 258.9 | 258.9 | 258.9  | 258.9  | 258.9  |
| 2.5°  | 259.8 | 259.8 | 259.8 | 259.8 | 260.8 | 260.8 | 260.8 | 260.8 | 260.8  | 259.8  | 259.8  |
| 5°    | 261.8 | 261.8 | 261.8 | 261.8 | 262.8 | 262.8 | 262.8 | 262.8 | 263.8  | 263.8  | 263.8  |
| 7.5°  | 263.8 | 263.8 | 264.8 | 264.8 | 265.8 | 265.8 | 266.8 | 266.8 | 267.7  | 268.7  | 268.7  |
| 10°   | 267.7 | 267.7 | 268.7 | 268.7 | 270.7 | 271.7 | 272.7 | 272.7 | 274.7  | 274.7  | 274.7  |
| 12.5° | 272.7 | 273.7 | 274.7 | 275.6 | 277.6 | 278.6 | 279.6 | 280.6 | 281.6  | 282.6  | 282.6  |
| 15°   | 280.6 | 279.6 | 281.6 | 283.5 | 284.5 | 286.5 | 287.5 | 288.5 | 290.5  | 292.4  | 292.4  |
| 17.5° | 286.5 | 287.5 | 288.5 | 290.5 | 292.4 | 295.4 | 297.4 | 299.4 | 301.3  | 303.3  | 303.3  |
| 20°   | 294.4 | 293.4 | 297.4 | 300.3 | 302.3 | 306.3 | 309.2 | 313.2 | 315.2  | 317.1  | 318.1  |
| 22.5° | 301.3 | 302.3 | 304.3 | 308.2 | 312.2 | 318.1 | 324.1 | 327.0 | 330.0  | 332.0  | 334.9  |
| 25°   | 310.2 | 311.2 | 314.2 | 318.1 | 324.1 | 331.0 | 337.9 | 341.8 | 344.8  | 348.8  | 351.7  |
| 27.5° | 319.1 | 319.1 | 324.1 | 330.0 | 336.9 | 345.8 | 353.7 | 357.6 | 362.6  | 367.5  | 369.5  |
| 30°   | 329.0 | 329.0 | 333.9 | 341.8 | 351.7 | 361.6 | 368.5 | 376.4 | 383.3  | 388.3  | 392.2  |
| 32.5° | 343.8 | 343.8 | 349.7 | 357.6 | 368.5 | 380.4 | 390.3 | 398.2 | 407.0  | 415.9  | 423.8  |
| 35°   | 360.6 | 361.6 | 369.5 | 379.4 | 392.2 | 407.0 | 415.9 | 426.8 | 436.7  | 451.5  | 459.4  |
| 37.5° | 387.3 | 388.3 | 397.2 | 410.0 | 422.9 | 438.7 | 453.5 | 466.3 | 481.1  | 497.9  | 503.9  |
| 40°   | 426.8 | 429.8 | 438.7 | 444.6 | 456.4 | 468.3 | 490.0 | 511.8 | 537.5  | 560.2  | 564.1  |
| 42.5° | 497.9 | 495.0 | 489.0 | 487.1 | 490.0 | 502.9 | 526.6 | 560.2 | 605.6  | 634.3  | 634.3  |
| 45°   | 525.6 | 525.6 | 526.6 | 524.6 | 522.6 | 531.5 | 559.2 | 612.5 | 676.8  | 716.3  | 724.2  |
| 47.5° | 530.5 | 531.5 | 540.4 | 548.3 | 550.3 | 560.2 | 593.8 | 663.9 | 749.9  | 808.2  | 813.1  |
| 50°   | 530.5 | 532.5 | 544.4 | 558.2 | 568.1 | 581.9 | 623.4 | 709.4 | 822.0  | 889.2  | 902.0  |
| 52.5° | 528.6 | 530.5 | 543.4 | 560.2 | 576.0 | 595.8 | 649.1 | 756.8 | 886.2  | 977.1  | 983.0  |
| 55°   | 523.6 | 525.6 | 541.4 | 559.2 | 577.0 | 603.7 | 669.8 | 797.3 | 948.5  | 1050.2 | 1061.1 |
| 57.5° | 517.7 | 520.7 | 537.5 | 556.2 | 573.0 | 605.6 | 683.7 | 828.9 | 998.8  | 1115.4 | 1135.2 |
| 60°   | 505.8 | 510.8 | 529.6 | 548.3 | 564.1 | 598.7 | 690.6 | 853.6 | 1036.4 | 1162.8 | 1182.6 |
| 62.5° | 482.1 | 487.1 | 507.8 | 528.6 | 544.4 | 581.9 | 686.6 | 865.5 | 1058.1 | 1192.5 | 1213.2 |
| 65°   | 452.5 | 454.5 | 477.2 | 498.9 | 514.7 | 554.3 | 669.8 | 863.5 | 1063.1 | 1202.4 | 1226.1 |
| 66°   | 437.7 | 438.7 | 465.3 | 486.1 | 498.9 | 542.4 | 660.0 | 856.6 | 1060.1 | 1201.4 | 1226.1 |
| 67.5° | 411.0 | 415.9 | 438.7 | 460.4 | 475.2 | 515.7 | 636.3 | 840.8 | 1048.2 | 1191.5 | 1217.2 |
| 70°   | 364.6 | 368.5 | 387.3 | 409.0 | 424.8 | 463.4 | 584.9 | 794.3 | 1004.8 | 1151.0 | 1180.6 |
| 72.5° | 314.2 | 317.1 | 336.9 | 352.7 | 362.6 | 404.1 | 522.6 | 718.3 | 928.7  | 1074.9 | 1103.6 |
| 75°   | 260.8 | 262.8 | 280.6 | 291.5 | 300.3 | 336.9 | 439.6 | 620.4 | 809.2  | 951.4  | 989.0  |
| 77.5° | 205.5 | 206.5 | 221.3 | 231.2 | 231.2 | 262.8 | 348.8 | 502.9 | 663.9  | 795.3  | 823.0  |
| 80°   | 151.2 | 150.2 | 159.1 | 164.0 | 167.0 | 187.7 | 250.9 | 369.5 | 505.8  | 608.6  | 635.3  |
| 82.5° | 98.8  | 97.8  | 103.7 | 105.7 | 105.7 | 118.6 | 158.1 | 234.2 | 332.0  | 413.0  | 428.8  |
| 85°   | 52.4  | 54.3  | 53.4  | 53.4  | 53.4  | 58.3  | 79.0  | 122.5 | 176.8  | 221.3  | 232.2  |
| 87.5° | 8.9   | 8.9   | 8.9   | 9.9   | 11.9  | 15.8  | 20.7  | 34.6  | 50.4   | 68.2   | 77.1   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: CCP-VA-1-740-U-T2

**CANDELA DISTRIBUTION (continued):**

|       | 91°    | 95°    | 105°   | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 258.9  | 258.9  | 258.9  | 258.9 | 258.9 | 258.9 | 258.9 | 258.9 | 258.9 | 258.9 | 258.9 |
| 2.5°  | 259.8  | 260.8  | 260.8  | 260.8 | 260.8 | 260.8 | 260.8 | 260.8 | 260.8 | 260.8 | 260.8 |
| 5°    | 263.8  | 263.8  | 263.8  | 264.8 | 264.8 | 264.8 | 264.8 | 264.8 | 264.8 | 264.8 | 264.8 |
| 7.5°  | 268.7  | 268.7  | 269.7  | 269.7 | 269.7 | 270.7 | 270.7 | 269.7 | 269.7 | 269.7 | 269.7 |
| 10°   | 274.7  | 274.7  | 275.6  | 276.6 | 276.6 | 277.6 | 277.6 | 276.6 | 276.6 | 275.6 | 275.6 |
| 12.5° | 282.6  | 283.5  | 284.5  | 285.5 | 286.5 | 286.5 | 285.5 | 284.5 | 283.5 | 282.6 | 282.6 |
| 15°   | 292.4  | 293.4  | 294.4  | 296.4 | 296.4 | 296.4 | 295.4 | 294.4 | 292.4 | 291.5 | 292.4 |
| 17.5° | 304.3  | 305.3  | 307.3  | 308.2 | 309.2 | 308.2 | 308.2 | 307.3 | 307.3 | 306.3 | 306.3 |
| 20°   | 319.1  | 320.1  | 323.1  | 324.1 | 324.1 | 325.0 | 328.0 | 330.0 | 332.9 | 333.9 | 333.9 |
| 22.5° | 333.9  | 335.9  | 338.9  | 342.8 | 344.8 | 348.8 | 349.7 | 351.7 | 350.7 | 347.8 | 347.8 |
| 25°   | 351.7  | 353.7  | 359.6  | 364.6 | 368.5 | 370.5 | 368.5 | 365.6 | 360.6 | 356.7 | 355.7 |
| 27.5° | 370.5  | 373.5  | 382.3  | 389.3 | 391.2 | 389.3 | 381.4 | 374.4 | 368.5 | 363.6 | 361.6 |
| 30°   | 394.2  | 399.1  | 409.0  | 413.0 | 412.0 | 404.1 | 392.2 | 383.3 | 374.4 | 368.5 | 367.5 |
| 32.5° | 423.8  | 428.8  | 437.7  | 438.7 | 432.7 | 417.9 | 402.1 | 390.3 | 379.4 | 372.5 | 371.5 |
| 35°   | 459.4  | 464.3  | 469.3  | 466.3 | 449.5 | 430.8 | 411.0 | 394.2 | 383.3 | 375.4 | 375.4 |
| 37.5° | 504.9  | 507.8  | 507.8  | 493.0 | 467.3 | 442.6 | 417.9 | 398.2 | 386.3 | 378.4 | 377.4 |
| 40°   | 564.1  | 563.1  | 549.3  | 520.7 | 487.1 | 453.5 | 422.9 | 402.1 | 387.3 | 379.4 | 378.4 |
| 42.5° | 635.3  | 628.4  | 598.7  | 552.3 | 505.8 | 463.4 | 428.8 | 403.1 | 386.3 | 378.4 | 377.4 |
| 45°   | 722.2  | 710.4  | 657.0  | 588.8 | 525.6 | 472.3 | 431.7 | 402.1 | 383.3 | 374.4 | 373.5 |
| 47.5° | 808.2  | 801.2  | 728.1  | 627.4 | 545.4 | 482.1 | 433.7 | 399.1 | 377.4 | 364.6 | 364.6 |
| 50°   | 899.1  | 882.3  | 799.3  | 673.8 | 566.1 | 489.0 | 433.7 | 394.2 | 367.5 | 353.7 | 351.7 |
| 52.5° | 987.0  | 970.2  | 871.4  | 720.2 | 588.8 | 496.0 | 431.7 | 387.3 | 358.6 | 343.8 | 341.8 |
| 55°   | 1062.1 | 1048.2 | 941.5  | 772.6 | 612.5 | 500.9 | 428.8 | 379.4 | 349.7 | 335.9 | 333.9 |
| 57.5° | 1131.2 | 1117.4 | 1002.8 | 817.1 | 635.3 | 503.9 | 421.9 | 369.5 | 338.9 | 325.0 | 324.1 |
| 60°   | 1181.6 | 1170.8 | 1055.2 | 858.6 | 654.0 | 503.9 | 412.0 | 357.6 | 327.0 | 313.2 | 312.2 |
| 62.5° | 1215.2 | 1204.3 | 1092.7 | 886.2 | 665.9 | 497.0 | 397.2 | 341.8 | 312.2 | 299.4 | 296.4 |
| 65°   | 1228.1 | 1218.2 | 1109.5 | 897.1 | 663.9 | 483.1 | 377.4 | 322.1 | 293.4 | 280.6 | 278.6 |
| 66°   | 1229.0 | 1218.2 | 1109.5 | 895.1 | 659.0 | 475.2 | 368.5 | 313.2 | 285.5 | 272.7 | 270.7 |
| 67.5° | 1221.1 | 1211.3 | 1102.6 | 885.2 | 645.1 | 460.4 | 350.7 | 298.4 | 270.7 | 257.9 | 256.9 |
| 70°   | 1184.6 | 1176.7 | 1065.0 | 847.7 | 612.5 | 427.8 | 321.1 | 269.7 | 243.0 | 234.2 | 231.2 |
| 72.5° | 1105.5 | 1096.7 | 990.0  | 777.5 | 559.2 | 383.3 | 283.5 | 236.1 | 214.4 | 203.5 | 202.5 |
| 75°   | 983.0  | 979.1  | 875.3  | 684.7 | 482.1 | 330.0 | 240.1 | 199.6 | 181.8 | 173.9 | 173.9 |
| 77.5° | 823.0  | 815.1  | 727.2  | 566.1 | 396.2 | 266.8 | 192.7 | 162.0 | 148.2 | 141.3 | 142.3 |
| 80°   | 640.2  | 634.3  | 560.2  | 424.8 | 299.4 | 200.6 | 144.2 | 123.5 | 113.6 | 109.7 | 107.7 |
| 82.5° | 438.7  | 422.9  | 373.5  | 281.6 | 194.6 | 135.4 | 99.8  | 86.0  | 81.0  | 80.0  | 79.0  |
| 85°   | 228.2  | 234.2  | 196.6  | 149.2 | 105.7 | 75.1  | 60.3  | 55.3  | 53.4  | 54.3  | 54.3  |
| 87.5° | 75.1   | 77.1   | 59.3   | 45.4  | 34.6  | 26.7  | 22.7  | 21.7  | 18.8  | 20.7  | 21.7  |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2005-785-13

Luminaire Tested: WIS-VA-3-740-U-T4FT

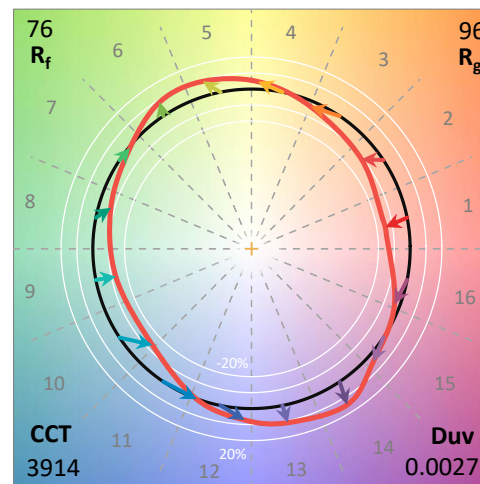
Test Date: 08/04/2020

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2005-785-13  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 08/04/2020  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **WIS-VA-3-740-U-T4FT**  
 Description: INVUE WALL PACK VA

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3914   | CRI (Ra): | 73.8 |      |       |
| CIE u':                   | 0.2252 | R1:       | 71.6 | R9:  | -14.4 |
| CIE v':                   | 0.5065 | R2:       | 79.1 | R10: | 49.8  |
| Duv:                      | 0.0027 | R3:       | 84.5 | R11: | 69.5  |
| CIE x:                    | 0.3862 | R4:       | 73.8 | R12: | 41.9  |
| CIE y:                    | 0.3861 | R5:       | 70.6 | R13: | 72.4  |
| CIE z:                    | 0.2276 | R6:       | 70.0 | R14: | 90.9  |
| Peak Wavelength (nm):     | 450    | R7:       | 83.1 |      |       |
| Dominant Wavelength (nm): | 578    | R8:       | 58.2 |      |       |
| Purity:                   | 31.9   |           |      |      |       |
| Rf:                       | 75.9   |           |      |      |       |
| Rg:                       | 95.8   |           |      |      |       |



### Test Conditions

Stabilization Time: 97M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.0/45%  
 Sphere Temperature (°C): 24.5

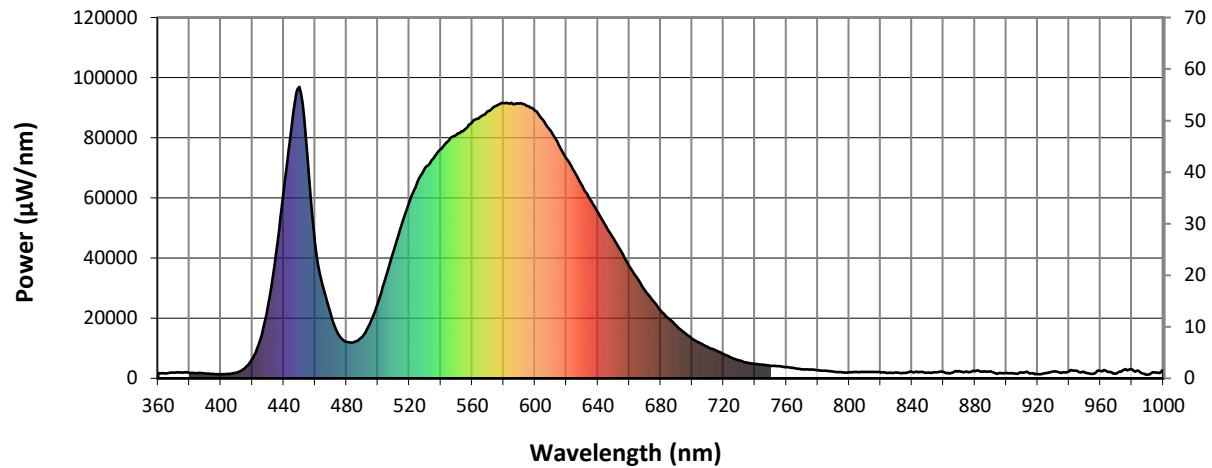
REPORT NUMBER: SP1-2005-785-13

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



REPORT NUMBER: SP1-2005-785-13

### Photopic Flux vs. Wavelength

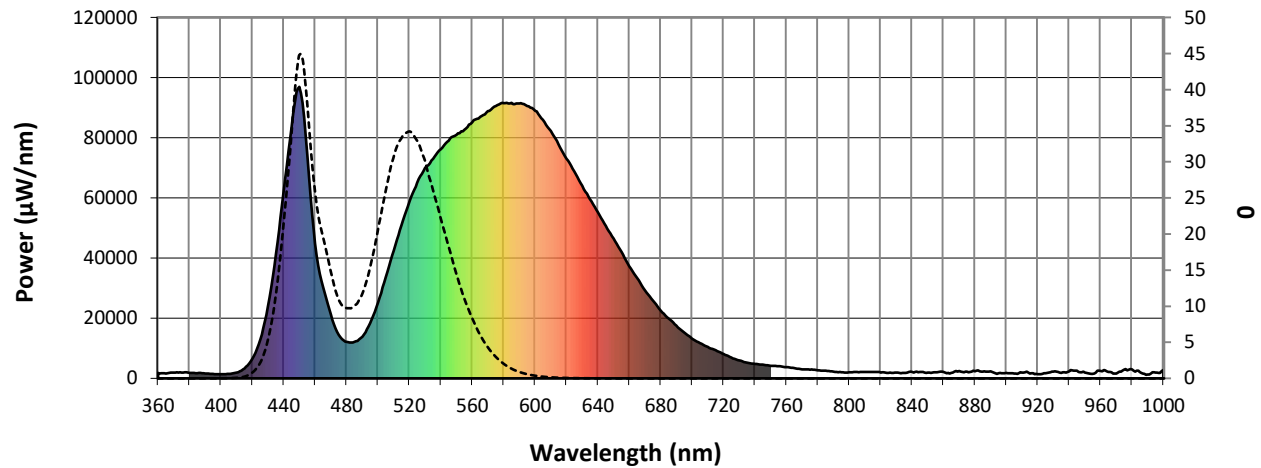


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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1777             | 0.0              | 490       | 13889            | 2.0              | 620       | 73034            | 19.0             | 750       | 4168             | 0.0              | 880       | 2380             | 0.0              |
| 365       | 1645             | 0.0              | 495       | 18334            | 3.3              | 625       | 68899            | 15.2             | 755       | 4006             | 0.0              | 885       | 2220             | 0.0              |
| 370       | 1873             | 0.0              | 500       | 25225            | 5.6              | 630       | 64021            | 11.6             | 760       | 3706             | 0.0              | 890       | 2311             | 0.0              |
| 375       | 1965             | 0.0              | 505       | 33622            | 9.4              | 635       | 59595            | 9.0              | 765       | 3453             | 0.0              | 895       | 1655             | 0.0              |
| 380       | 1854             | 0.0              | 510       | 42469            | 14.6             | 640       | 55182            | 6.6              | 770       | 2984             | 0.0              | 900       | 1845             | 0.0              |
| 385       | 1682             | 0.0              | 515       | 50827            | 21.1             | 645       | 50671            | 4.9              | 775       | 2915             | 0.0              | 905       | 1614             | 0.0              |
| 390       | 1620             | 0.0              | 520       | 58760            | 28.5             | 650       | 46455            | 3.4              | 780       | 2713             | 0.0              | 910       | 1919             | 0.0              |
| 395       | 1465             | 0.0              | 525       | 65016            | 34.9             | 655       | 42012            | 2.4              | 785       | 2521             | 0.0              | 915       | 1651             | 0.0              |
| 400       | 1369             | 0.0              | 530       | 70032            | 41.2             | 660       | 37258            | 1.6              | 790       | 2187             | 0.0              | 920       | 1386             | 0.0              |
| 405       | 1472             | 0.0              | 535       | 73041            | 45.3             | 665       | 33282            | 1.1              | 795       | 2010             | 0.0              | 925       | 1654             | 0.0              |
| 410       | 1921             | 0.0              | 540       | 76154            | 49.6             | 670       | 29305            | 0.6              | 800       | 1980             | 0.0              | 930       | 2256             | 0.0              |
| 415       | 3297             | 0.0              | 545       | 79118            | 52.7             | 675       | 25857            | 0.4              | 805       | 2112             | 0.0              | 935       | 1853             | 0.0              |
| 420       | 6480             | 0.0              | 550       | 81000            | 55.0             | 680       | 22592            | 0.3              | 810       | 2148             | 0.0              | 940       | 2392             | 0.0              |
| 425       | 12903            | 0.1              | 555       | 82646            | 56.4             | 685       | 19937            | 0.2              | 815       | 2119             | 0.0              | 945       | 2525             | 0.0              |
| 430       | 24020            | 0.2              | 560       | 85163            | 57.9             | 690       | 17536            | 0.1              | 820       | 1966             | 0.0              | 950       | 1880             | 0.0              |
| 435       | 41399            | 0.5              | 565       | 86959            | 57.8             | 695       | 15253            | 0.1              | 825       | 1813             | 0.0              | 955       | 1472             | 0.0              |
| 440       | 62213            | 1.0              | 570       | 88812            | 57.7             | 700       | 13252            | 0.0              | 830       | 1933             | 0.0              | 960       | 2448             | 0.0              |
| 445       | 83734            | 1.7              | 575       | 90518            | 56.3             | 705       | 11730            | 0.0              | 835       | 1863             | 0.0              | 965       | 2185             | 0.0              |
| 450       | 96938            | 2.5              | 580       | 91567            | 54.4             | 710       | 10390            | 0.0              | 840       | 2087             | 0.0              | 970       | 1600             | 0.0              |
| 455       | 74147            | 2.5              | 585       | 91648            | 50.9             | 715       | 9321             | 0.0              | 845       | 2119             | 0.0              | 975       | 2867             | 0.0              |
| 460       | 44763            | 1.8              | 590       | 91405            | 47.3             | 720       | 8040             | 0.0              | 850       | 1872             | 0.0              | 980       | 3029             | 0.0              |
| 465       | 30427            | 1.6              | 595       | 90610            | 42.9             | 725       | 6876             | 0.0              | 855       | 2001             | 0.0              | 985       | 2108             | 0.0              |
| 470       | 21030            | 1.3              | 600       | 88999            | 38.4             | 730       | 5969             | 0.0              | 860       | 2128             | 0.0              | 990       | 1266             | 0.0              |
| 475       | 14459            | 1.1              | 605       | 86003            | 33.3             | 735       | 5202             | 0.0              | 865       | 1779             | 0.0              | 995       | 1939             | 0.0              |
| 480       | 12138            | 1.2              | 610       | 82309            | 28.3             | 740       | 4843             | 0.0              | 870       | 2479             | 0.0              | 1000      | 2782             | 0.0              |
| 485       | 12135            | 1.4              | 615       | 77745            | 23.5             | 745       | 4567             | 0.0              | 875       | 2223             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2005-785-13

### Scotopic Flux vs. Wavelength



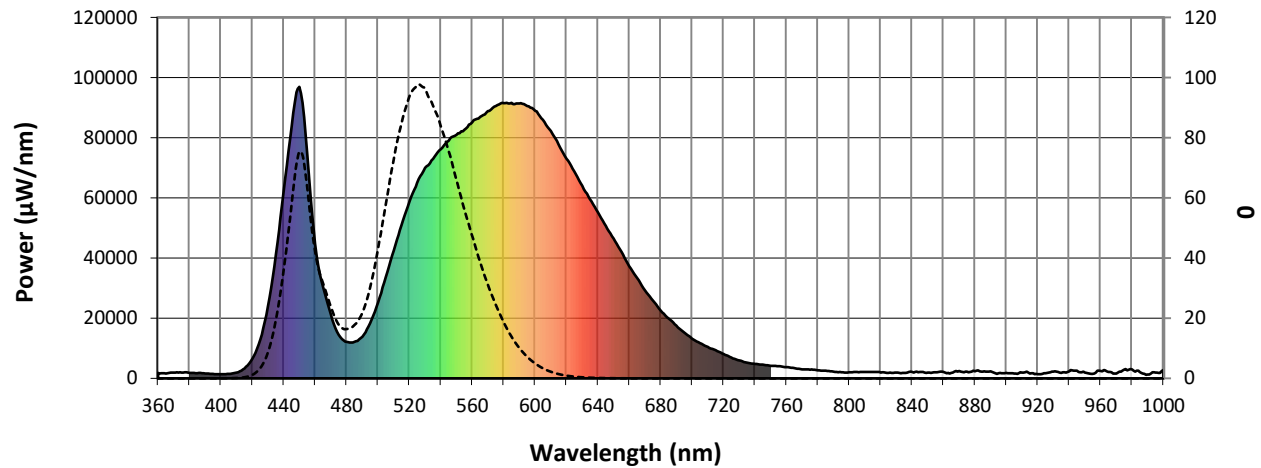
Scotopic Lumens: 3014.1

S/P: 0.57

| 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       | 1777             | 0.0              | 490       | 13889            | 21.4             | 620       | 73034            | 0.9              | 750       | 4168             | 0.0              | 880       | 2380             | 0.0              |
| 365       | 1645             | 0.0              | 495       | 18334            | 29.6             | 625       | 68899            | 0.6              | 755       | 4006             | 0.0              | 885       | 2220             | 0.0              |
| 370       | 1873             | 0.0              | 500       | 25225            | 42.2             | 630       | 64021            | 0.4              | 760       | 3706             | 0.0              | 890       | 2311             | 0.0              |
| 375       | 1965             | 0.0              | 505       | 33622            | 57.2             | 635       | 59595            | 0.2              | 765       | 3453             | 0.0              | 895       | 1655             | 0.0              |
| 380       | 1854             | 0.0              | 510       | 42469            | 72.0             | 640       | 55182            | 0.1              | 770       | 2984             | 0.0              | 900       | 1845             | 0.0              |
| 385       | 1682             | 0.0              | 515       | 50827            | 84.2             | 645       | 50671            | 0.1              | 775       | 2915             | 0.0              | 905       | 1614             | 0.0              |
| 390       | 1620             | 0.0              | 520       | 58760            | 93.4             | 650       | 46455            | 0.1              | 780       | 2713             | 0.0              | 910       | 1919             | 0.0              |
| 395       | 1465             | 0.0              | 525       | 65016            | 97.3             | 655       | 42012            | 0.0              | 785       | 2521             | 0.0              | 915       | 1651             | 0.0              |
| 400       | 1369             | 0.0              | 530       | 70032            | 96.6             | 660       | 37258            | 0.0              | 790       | 2187             | 0.0              | 920       | 1386             | 0.0              |
| 405       | 1472             | 0.0              | 535       | 73041            | 91.0             | 665       | 33282            | 0.0              | 795       | 2010             | 0.0              | 925       | 1654             | 0.0              |
| 410       | 1921             | 0.1              | 540       | 76154            | 84.2             | 670       | 29305            | 0.0              | 800       | 1980             | 0.0              | 930       | 2256             | 0.0              |
| 415       | 3297             | 0.3              | 545       | 79118            | 75.9             | 675       | 25857            | 0.0              | 805       | 2112             | 0.0              | 935       | 1853             | 0.0              |
| 420       | 6480             | 1.1              | 550       | 81000            | 66.2             | 680       | 22592            | 0.0              | 810       | 2148             | 0.0              | 940       | 2392             | 0.0              |
| 425       | 12903            | 3.2              | 555       | 82646            | 56.5             | 685       | 19937            | 0.0              | 815       | 2119             | 0.0              | 945       | 2525             | 0.0              |
| 430       | 24020            | 8.2              | 560       | 85163            | 47.6             | 690       | 17536            | 0.0              | 820       | 1966             | 0.0              | 950       | 1880             | 0.0              |
| 435       | 41399            | 18.5             | 565       | 86959            | 39.0             | 695       | 15253            | 0.0              | 825       | 1813             | 0.0              | 955       | 1472             | 0.0              |
| 440       | 62213            | 34.8             | 570       | 88812            | 31.3             | 700       | 13252            | 0.0              | 830       | 1933             | 0.0              | 960       | 2448             | 0.0              |
| 445       | 83734            | 56.1             | 575       | 90518            | 24.7             | 705       | 11730            | 0.0              | 835       | 1863             | 0.0              | 965       | 2185             | 0.0              |
| 450       | 96938            | 75.1             | 580       | 91567            | 18.9             | 710       | 10390            | 0.0              | 840       | 2087             | 0.0              | 970       | 1600             | 0.0              |
| 455       | 74147            | 64.8             | 585       | 91648            | 14.0             | 715       | 9321             | 0.0              | 845       | 2119             | 0.0              | 975       | 2867             | 0.0              |
| 460       | 44763            | 43.2             | 590       | 91405            | 10.2             | 720       | 8040             | 0.0              | 850       | 1872             | 0.0              | 980       | 3029             | 0.0              |
| 465       | 30427            | 32.1             | 595       | 90610            | 7.2              | 725       | 6876             | 0.0              | 855       | 2001             | 0.0              | 985       | 2108             | 0.0              |
| 470       | 21030            | 24.2             | 600       | 88999            | 5.0              | 730       | 5969             | 0.0              | 860       | 2128             | 0.0              | 990       | 1266             | 0.0              |
| 475       | 14459            | 18.1             | 605       | 86003            | 3.4              | 735       | 5202             | 0.0              | 865       | 1779             | 0.0              | 995       | 1939             | 0.0              |
| 480       | 12138            | 16.4             | 610       | 82309            | 2.2              | 740       | 4843             | 0.0              | 870       | 2479             | 0.0              | 1000      | 2782             | 0.0              |
| 485       | 12135            | 17.6             | 615       | 77745            | 1.4              | 745       | 4567             | 0.0              | 875       | 2223             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2005-785-13

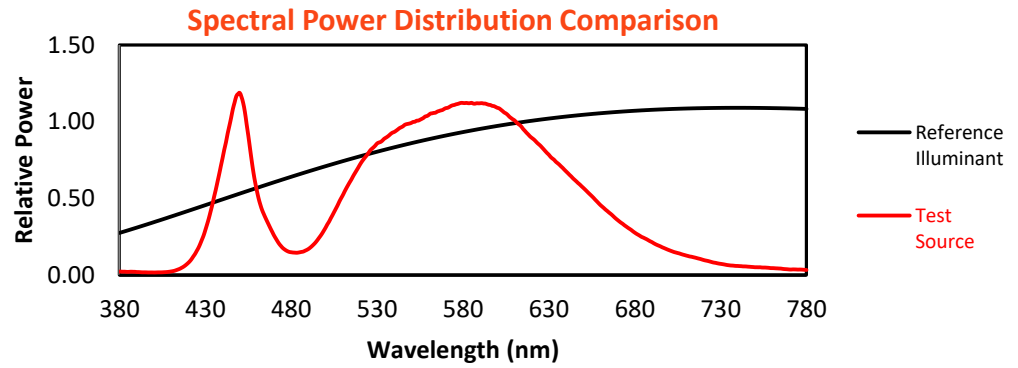
### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 7943.1**
**S/P: 1.5**

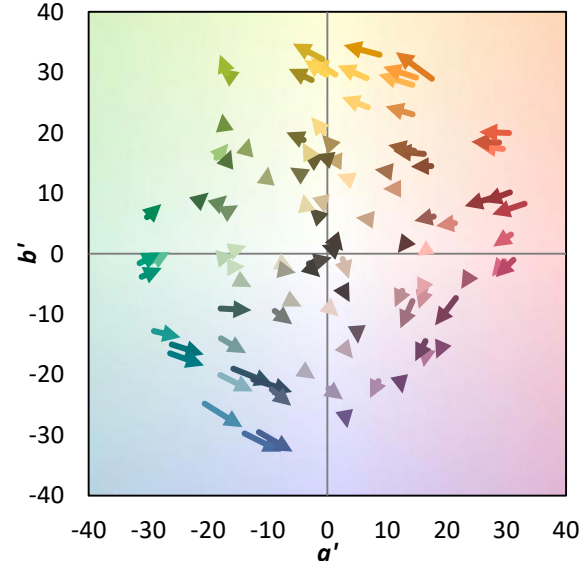
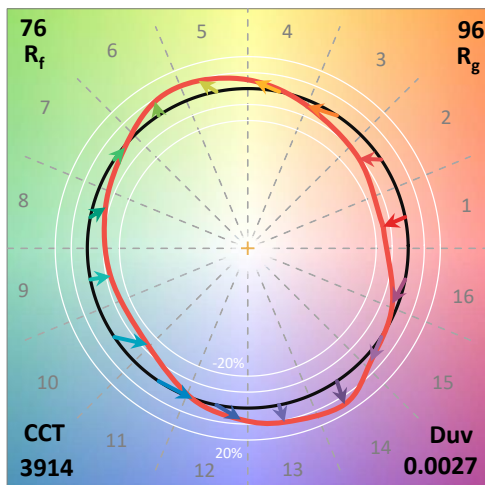
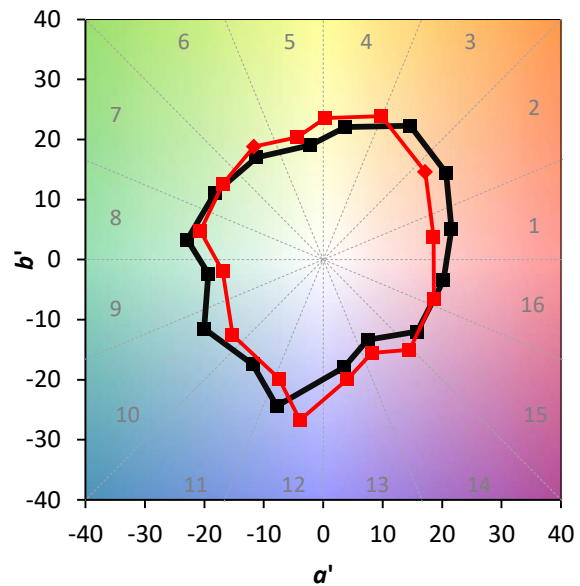
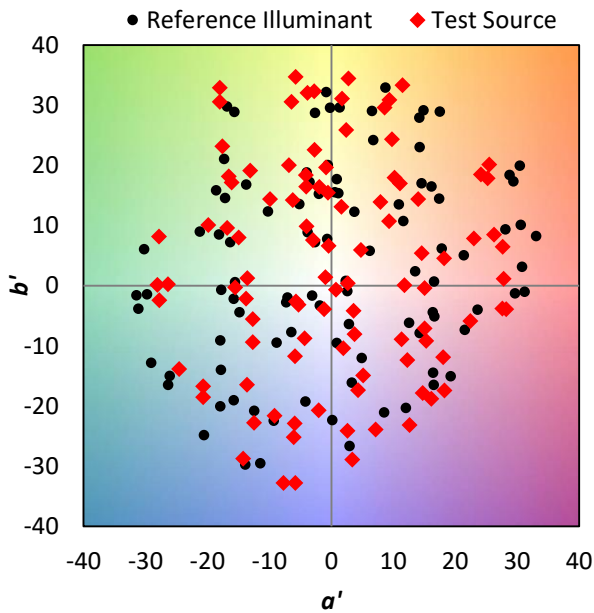
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1777             | 0.0              | 490       | 13889            | 11.6             | 620       | 73034            | 0.1              | 750       | 4168             | 0.0              | 880       | 2380             | 0.0              |
| 365       | 1645             | 0.0              | 495       | 18334            | 15.1             | 625       | 68899            | 0.0              | 755       | 4006             | 0.0              | 885       | 2220             | 0.0              |
| 370       | 1873             | 0.0              | 500       | 25225            | 20.3             | 630       | 64021            | 0.0              | 760       | 3706             | 0.0              | 890       | 2311             | 0.0              |
| 375       | 1965             | 0.0              | 505       | 33622            | 25.8             | 635       | 59595            | 0.0              | 765       | 3453             | 0.0              | 895       | 1655             | 0.0              |
| 380       | 1854             | 0.0              | 510       | 42469            | 30.5             | 640       | 55182            | 0.0              | 770       | 2984             | 0.0              | 900       | 1845             | 0.0              |
| 385       | 1682             | 0.0              | 515       | 50827            | 33.2             | 645       | 50671            | 0.0              | 775       | 2915             | 0.0              | 905       | 1614             | 0.0              |
| 390       | 1620             | 0.0              | 520       | 58760            | 34.2             | 650       | 46455            | 0.0              | 780       | 2713             | 0.0              | 910       | 1919             | 0.0              |
| 395       | 1465             | 0.0              | 525       | 65016            | 33.0             | 655       | 42012            | 0.0              | 785       | 2521             | 0.0              | 915       | 1651             | 0.0              |
| 400       | 1369             | 0.0              | 530       | 70032            | 30.3             | 660       | 37258            | 0.0              | 790       | 2187             | 0.0              | 920       | 1386             | 0.0              |
| 405       | 1472             | 0.0              | 535       | 73041            | 26.3             | 665       | 33282            | 0.0              | 795       | 2010             | 0.0              | 925       | 1654             | 0.0              |
| 410       | 1921             | 0.1              | 540       | 76154            | 22.3             | 670       | 29305            | 0.0              | 800       | 1980             | 0.0              | 930       | 2256             | 0.0              |
| 415       | 3297             | 0.2              | 545       | 79118            | 18.4             | 675       | 25857            | 0.0              | 805       | 2112             | 0.0              | 935       | 1853             | 0.0              |
| 420       | 6480             | 0.7              | 550       | 81000            | 14.5             | 680       | 22592            | 0.0              | 810       | 2148             | 0.0              | 940       | 2392             | 0.0              |
| 425       | 12903            | 2.0              | 555       | 82646            | 11.1             | 685       | 19937            | 0.0              | 815       | 2119             | 0.0              | 945       | 2525             | 0.0              |
| 430       | 24020            | 5.1              | 560       | 85163            | 8.4              | 690       | 17536            | 0.0              | 820       | 1966             | 0.0              | 950       | 1880             | 0.0              |
| 435       | 41399            | 11.0             | 565       | 86959            | 6.1              | 695       | 15253            | 0.0              | 825       | 1813             | 0.0              | 955       | 1472             | 0.0              |
| 440       | 62213            | 20.8             | 570       | 88812            | 4.3              | 700       | 13252            | 0.0              | 830       | 1933             | 0.0              | 960       | 2448             | 0.0              |
| 445       | 83734            | 33.0             | 575       | 90518            | 3.0              | 705       | 11730            | 0.0              | 835       | 1863             | 0.0              | 965       | 2185             | 0.0              |
| 450       | 96938            | 44.7             | 580       | 91567            | 2.0              | 710       | 10390            | 0.0              | 840       | 2087             | 0.0              | 970       | 1600             | 0.0              |
| 455       | 74147            | 38.8             | 585       | 91648            | 1.4              | 715       | 9321             | 0.0              | 845       | 2119             | 0.0              | 975       | 2867             | 0.0              |
| 460       | 44763            | 26.4             | 590       | 91405            | 0.9              | 720       | 8040             | 0.0              | 850       | 1872             | 0.0              | 980       | 3029             | 0.0              |
| 465       | 30427            | 19.9             | 595       | 90610            | 0.6              | 725       | 6876             | 0.0              | 855       | 2001             | 0.0              | 985       | 2108             | 0.0              |
| 470       | 21030            | 15.1             | 600       | 88999            | 0.4              | 730       | 5969             | 0.0              | 860       | 2128             | 0.0              | 990       | 1266             | 0.0              |
| 475       | 14459            | 11.0             | 605       | 86003            | 0.2              | 735       | 5202             | 0.0              | 865       | 1779             | 0.0              | 995       | 1939             | 0.0              |
| 480       | 12138            | 9.8              | 610       | 82309            | 0.1              | 740       | 4843             | 0.0              | 870       | 2479             | 0.0              | 1000      | 2782             | 0.0              |
| 485       | 12135            | 10.0             | 615       | 77745            | 0.1              | 745       | 4567             | 0.0              | 875       | 2223             | 0.0              |           |                  |                  |

### Summary

$R_f = 75.9$   
 $R_g = 95.8$   
 CIE  $R_a = 73.8$   
 $R_g = -14.4$



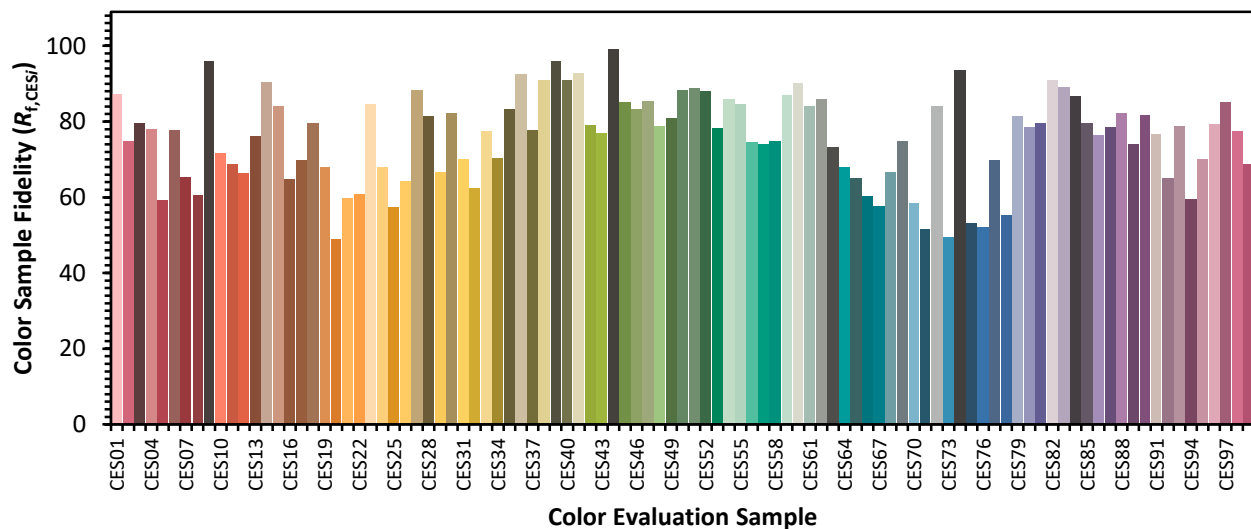
### Color Vector Graphics

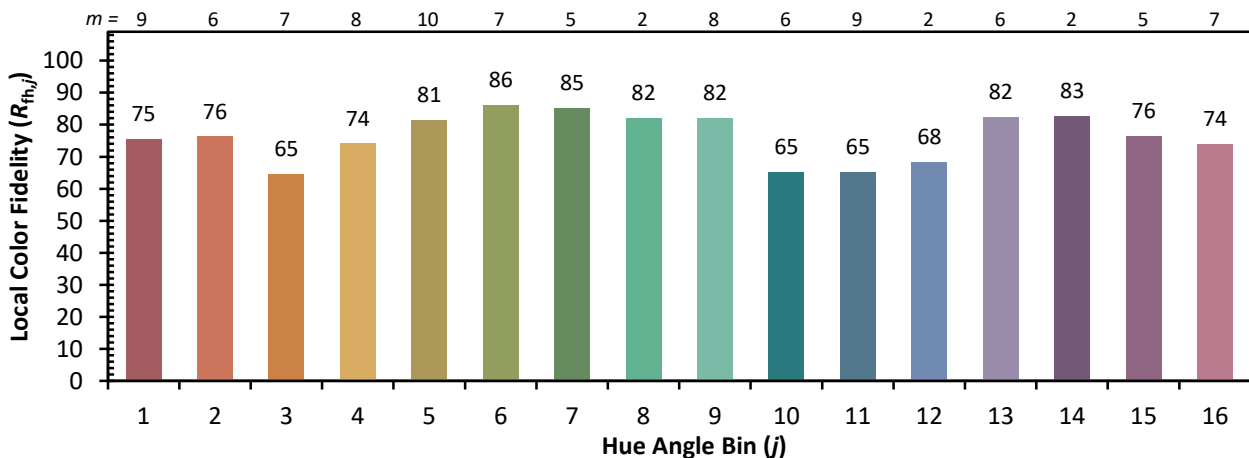
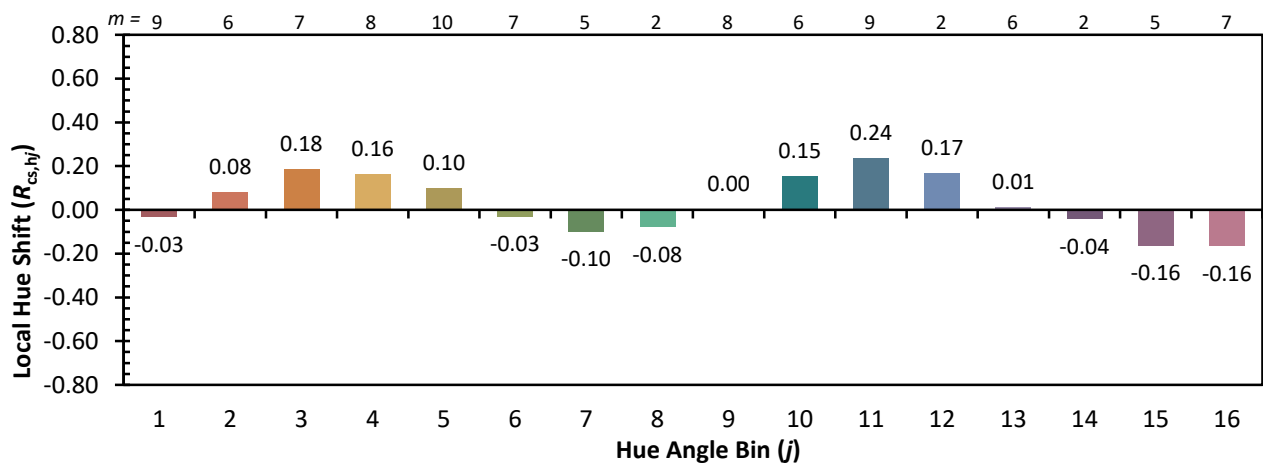
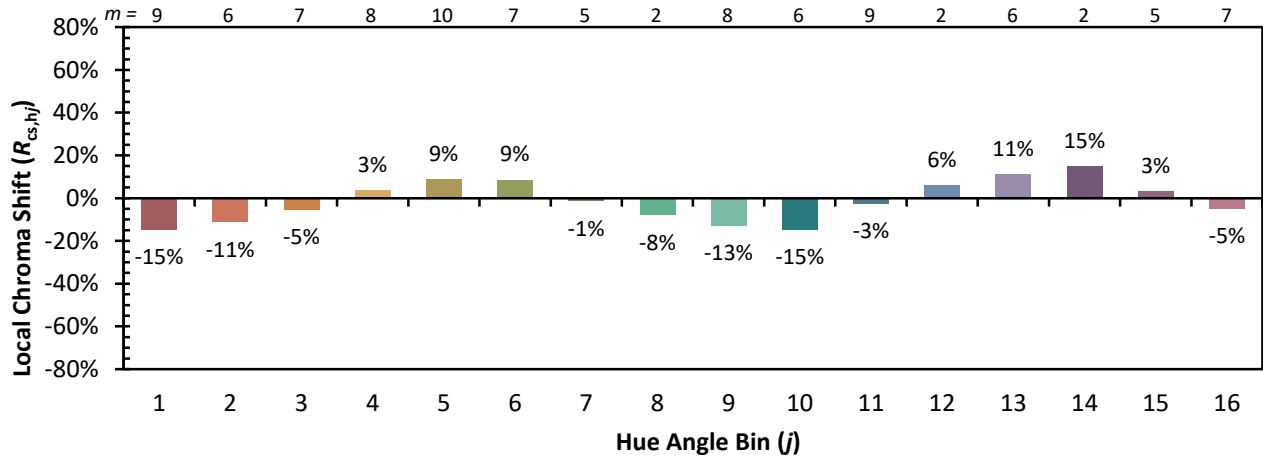


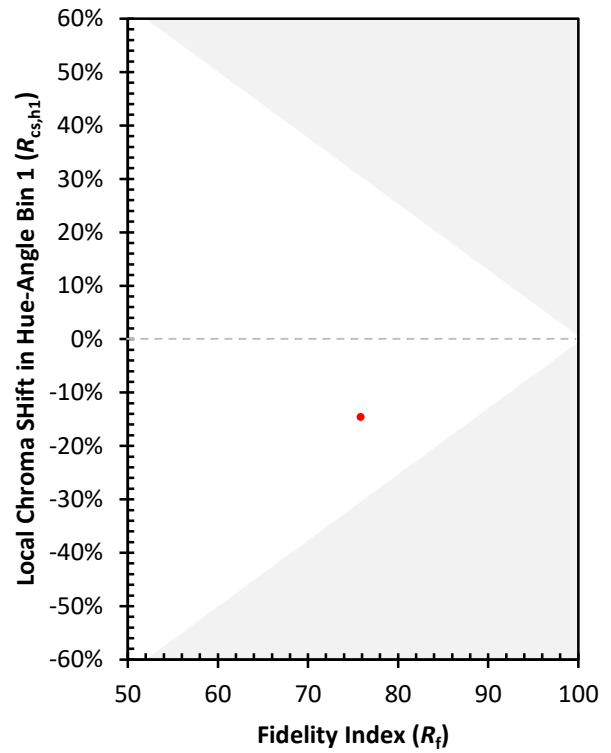
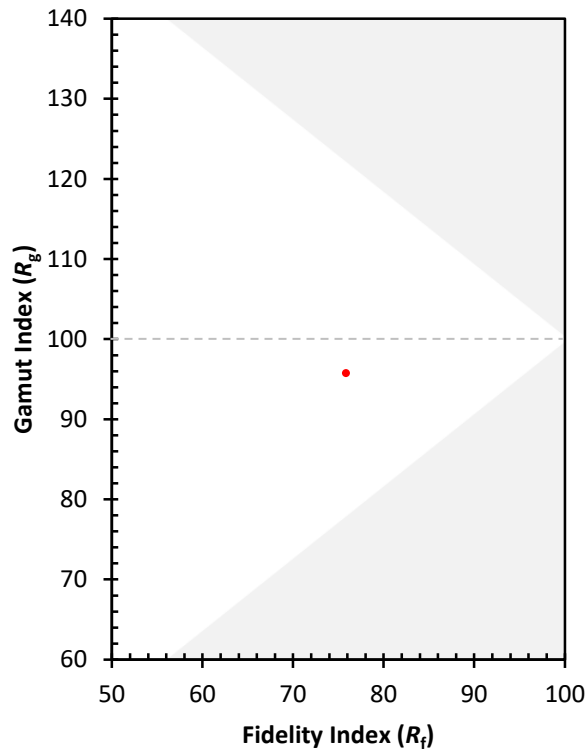


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 64 | CES51 = 89 | CES76 = 52 |
| CES02 = 61 | CES27 = 88 | CES52 = 88 | CES77 = 70 |
| CES03 = 30 | CES28 = 81 | CES53 = 78 | CES78 = 55 |
| CES04 = 70 | CES29 = 67 | CES54 = 86 | CES79 = 81 |
| CES05 = 48 | CES30 = 82 | CES55 = 85 | CES80 = 78 |
| CES06 = 50 | CES31 = 70 | CES56 = 75 | CES81 = 80 |
| CES07 = 40 | CES32 = 62 | CES57 = 74 | CES82 = 91 |
| CES08 = 39 | CES33 = 78 | CES58 = 75 | CES83 = 89 |
| CES09 = 29 | CES34 = 70 | CES59 = 87 | CES84 = 87 |
| CES10 = 74 | CES35 = 83 | CES60 = 90 | CES85 = 80 |
| CES11 = 57 | CES36 = 92 | CES61 = 84 | CES86 = 76 |
| CES12 = 63 | CES37 = 78 | CES62 = 86 | CES87 = 78 |
| CES13 = 42 | CES38 = 91 | CES63 = 73 | CES88 = 82 |
| CES14 = 74 | CES39 = 96 | CES64 = 68 | CES89 = 74 |
| CES15 = 71 | CES40 = 91 | CES65 = 65 | CES90 = 82 |
| CES16 = 47 | CES41 = 93 | CES66 = 60 | CES91 = 77 |
| CES17 = 49 | CES42 = 79 | CES67 = 58 | CES92 = 65 |
| CES18 = 56 | CES43 = 77 | CES68 = 67 | CES93 = 79 |
| CES19 = 71 | CES44 = 99 | CES69 = 75 | CES94 = 60 |
| CES20 = 65 | CES45 = 85 | CES70 = 59 | CES95 = 70 |
| CES21 = 86 | CES46 = 83 | CES71 = 52 | CES96 = 79 |
| CES22 = 78 | CES47 = 85 | CES72 = 84 | CES97 = 85 |
| CES23 = 92 | CES48 = 79 | CES73 = 49 | CES98 = 78 |
| CES24 = 91 | CES49 = 81 | CES74 = 94 | CES99 = 69 |
| CES25 = 72 | CES50 = 88 | CES75 = 53 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**


(END OF REPORT)