

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: P438013

Luminaire Tested: **IST-SA1A-735-U-SL4**

Issue Date: 12/10/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P438013  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-18)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/10/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: IST-SA1A-735-U-SL4  
Description: IMPACT ELITE LED TRAPEZOID LUMINAIRE  
(1) 70 CRI, 3500K, 350mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV SPILL LIGHT  
ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

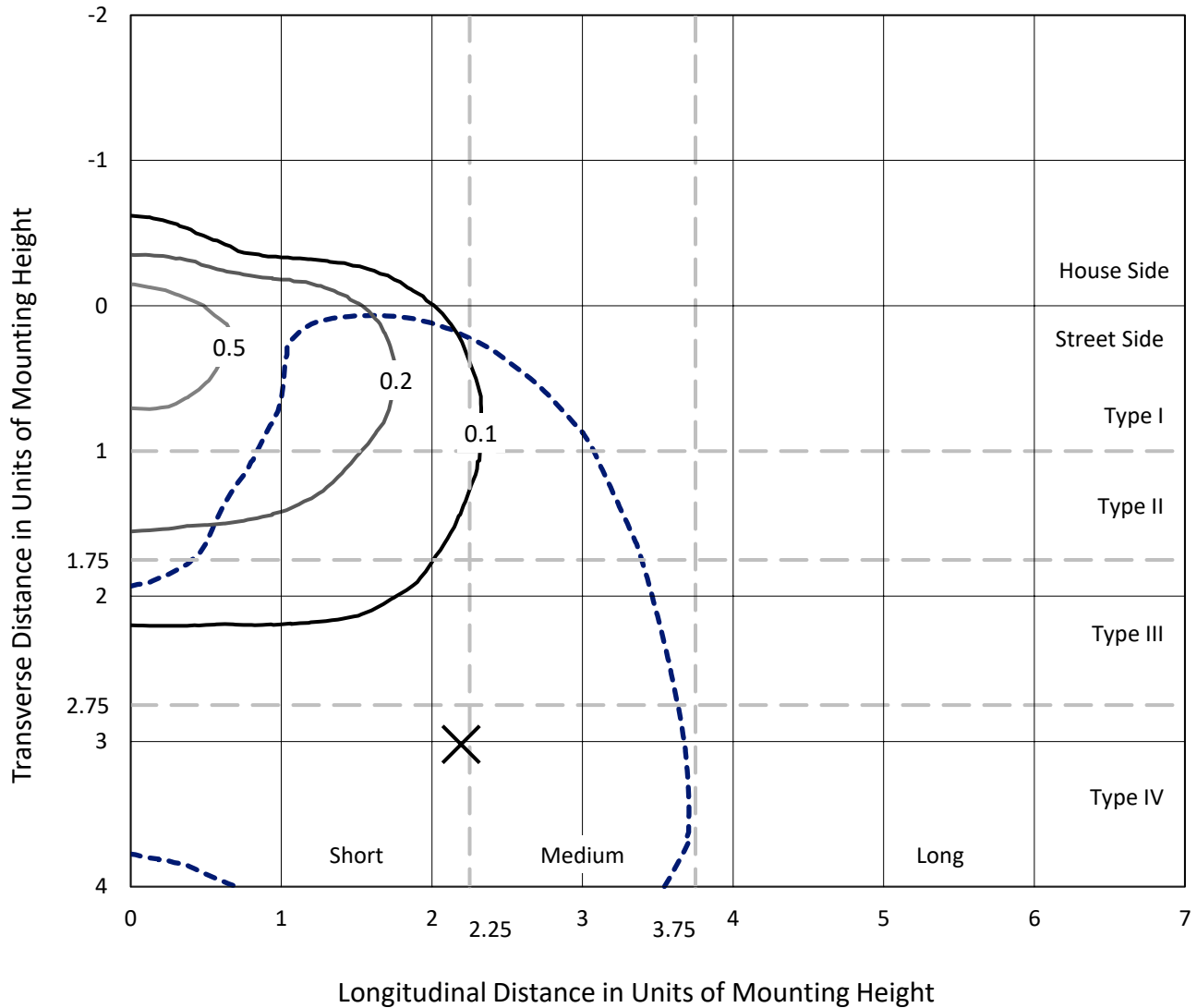
Lumens per Lamp: N/A  
Luminaire Lumens: 2504 lumens  
Efficiency: N/A  
Efficacy: 124.6 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G1  
  
Input Watts (W): 20.1  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

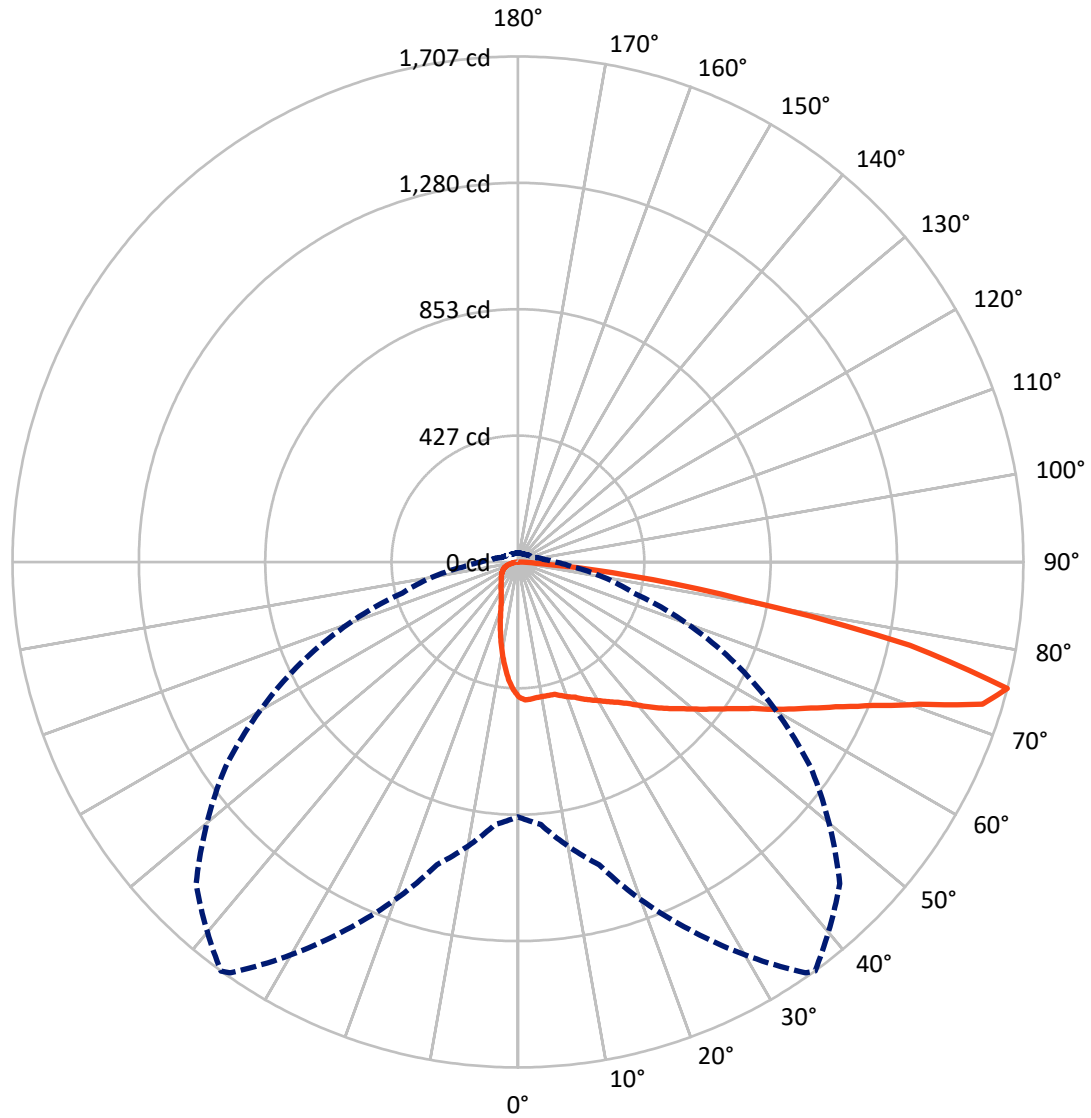
× Max cd  
 - - - 1/2 Max cd



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

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### Luminous Intensity Polar Plot



— Vertical Plane Through 36-Deg Lateral    - - - Horizontal Cone Through 75-Deg Vertical

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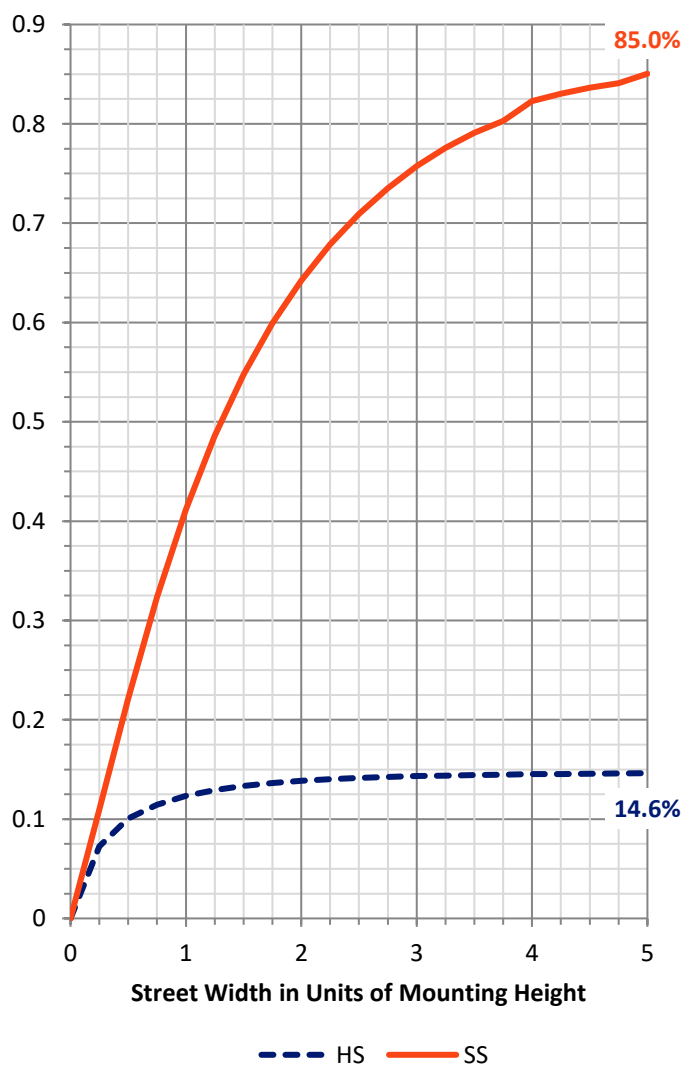
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 369.5    | 0.0    | 369.5  |
|                    | % Fixture | 14.8     | 0.0    | 14.8   |
| <b>Street Side</b> | Lumens    | 2134.4   | 0.0    | 2134.4 |
|                    | % Fixture | 85.2     | 0.0    | 85.2   |
| <b>Total</b>       | Lumens    | 2504.0   | 0.0    | 2504.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 40.3   | 1.6       |
| 10°-20°   | 104.2  | 4.2       |
| 20°-30°   | 161.1  | 6.4       |
| 30°-40°   | 233.4  | 9.3       |
| 40°-50°   | 337.5  | 13.5      |
| 50°-60°   | 468.1  | 18.7      |
| 60°-70°   | 591.1  | 23.6      |
| 70°-80°   | 507.7  | 20.3      |
| 80°-90°   | 60.5   | 2.4       |
| 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°    | 2504.0 | 100.0     |
| 0°-180°   | 2504.0 | 100.0     |

**Coefficient of Utilization**



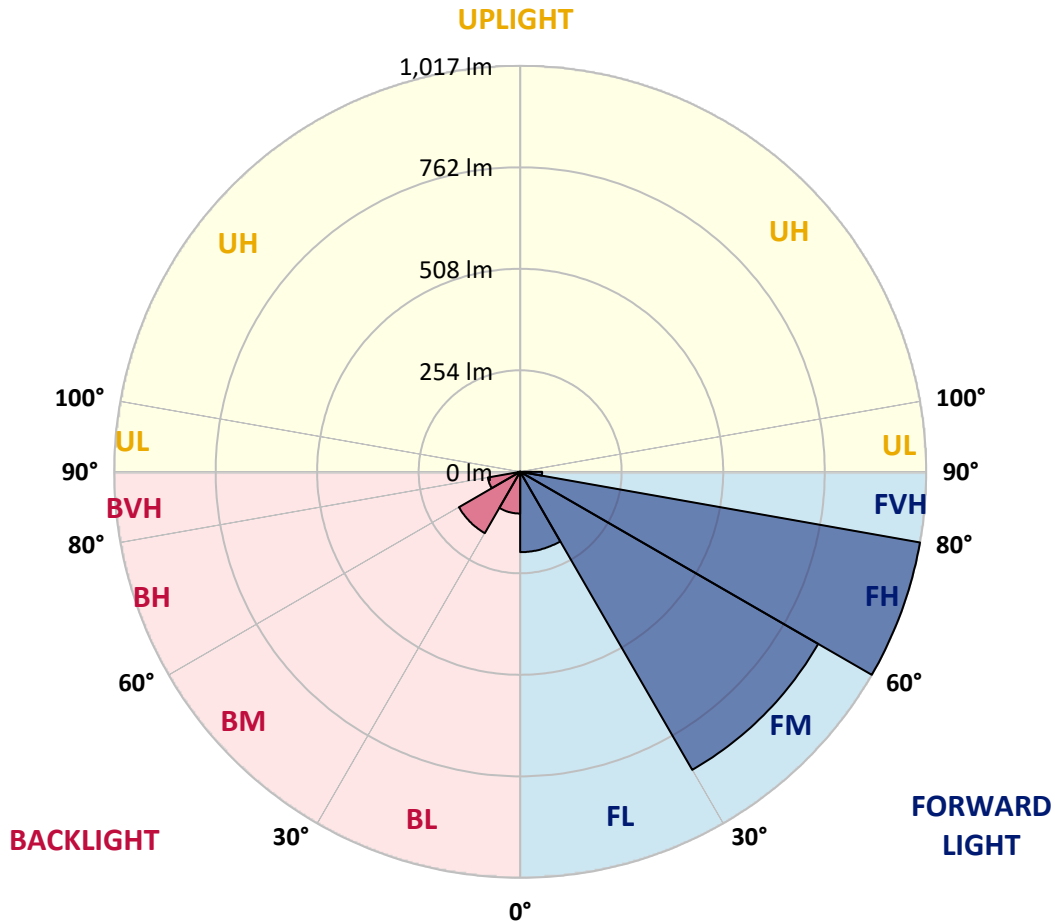
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 201.1  | 8.0       |                         |      |         |
| FM (30°-60°)   | 861.8  | 34.4      |                         |      |         |
| FH (60°-80°)   | 1016.6 | 40.6      |                         |      | G1/1800 |
| FVH (80°-90°)  | 54.9   | 2.2       |                         |      | G1/100  |
| BL (0°-30°)    | 104.5  | 4.2       | B0/110                  |      |         |
| BM (30°-60°)   | 177.2  | 7.1       | B0/220                  |      |         |
| BH (60°-80°)   | 82.3   | 3.3       | B0/110                  |      | G0/110  |
| BVH (80°-90°)  | 5.6    | 0.2       |                         |      | G0/10   |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°     | 15°    | 25°    | 35°    | 36°    | 45°    | 55°    | 65°    | 75°    | 85°   |
|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 0°    | 456.8 | 456.8  | 456.8  | 456.8  | 456.8  | 456.8  | 456.8  | 456.8  | 456.8  | 456.8  | 456.8 |
| 2.5°  | 469.9 | 469.9  | 469.9  | 469.0  | 467.1  | 466.2  | 464.3  | 462.4  | 461.5  | 457.8  | 456.8 |
| 5°    | 469.9 | 470.9  | 469.9  | 469.0  | 467.1  | 465.3  | 463.4  | 459.6  | 456.8  | 452.2  | 447.5 |
| 7.5°  | 465.3 | 466.2  | 466.2  | 465.3  | 463.4  | 462.4  | 460.6  | 455.9  | 452.2  | 445.6  | 438.2 |
| 10°   | 457.8 | 459.6  | 459.6  | 460.6  | 461.5  | 461.5  | 459.6  | 455.9  | 450.3  | 442.8  | 430.7 |
| 12.5° | 448.4 | 453.1  | 455.9  | 458.7  | 462.4  | 462.4  | 463.4  | 457.8  | 453.1  | 442.8  | 430.7 |
| 15°   | 445.6 | 448.4  | 454.0  | 462.4  | 466.2  | 463.4  | 467.1  | 464.3  | 458.7  | 448.4  | 433.5 |
| 17.5° | 444.7 | 447.5  | 456.8  | 467.1  | 472.7  | 474.6  | 474.6  | 470.9  | 464.3  | 454.0  | 435.4 |
| 20°   | 448.4 | 452.2  | 464.3  | 477.4  | 485.8  | 485.8  | 484.9  | 480.2  | 471.8  | 459.6  | 439.1 |
| 22.5° | 460.6 | 461.5  | 475.5  | 491.4  | 497.9  | 496.1  | 497.9  | 489.5  | 480.2  | 468.1  | 443.8 |
| 25°   | 476.5 | 478.3  | 489.5  | 508.2  | 512.0  | 512.9  | 510.1  | 500.8  | 490.5  | 478.3  | 449.4 |
| 27.5° | 497.9 | 500.8  | 509.2  | 526.9  | 529.7  | 527.8  | 524.1  | 512.9  | 502.6  | 491.4  | 460.6 |
| 30°   | 523.2 | 525.0  | 535.3  | 542.8  | 545.6  | 543.7  | 540.9  | 528.8  | 520.4  | 510.1  | 477.4 |
| 32.5° | 547.5 | 548.4  | 559.6  | 567.1  | 562.4  | 562.4  | 558.7  | 546.5  | 540.0  | 538.1  | 498.9 |
| 35°   | 572.7 | 574.6  | 584.8  | 588.6  | 581.1  | 582.0  | 581.1  | 570.8  | 572.7  | 576.4  | 531.6 |
| 37.5° | 596.0 | 598.8  | 611.0  | 611.9  | 609.1  | 606.3  | 609.1  | 603.5  | 607.3  | 622.2  | 569.9 |
| 40°   | 616.6 | 620.3  | 635.3  | 638.1  | 637.2  | 637.2  | 639.0  | 638.1  | 652.1  | 676.4  | 616.6 |
| 42.5° | 633.4 | 638.1  | 655.8  | 663.3  | 668.9  | 671.7  | 678.3  | 680.1  | 700.7  | 739.9  | 670.8 |
| 45°   | 650.2 | 654.9  | 679.2  | 691.3  | 704.4  | 705.3  | 718.4  | 725.0  | 763.3  | 798.8  | 729.6 |
| 47.5° | 669.8 | 675.5  | 697.9  | 722.2  | 737.1  | 739.9  | 764.2  | 777.3  | 824.0  | 869.8  | 784.8 |
| 50°   | 696.9 | 698.8  | 716.6  | 757.7  | 776.4  | 781.0  | 808.1  | 835.2  | 886.6  | 932.4  | 833.3 |
| 52.5° | 730.6 | 728.7  | 737.1  | 789.4  | 818.4  | 824.9  | 868.8  | 895.9  | 957.6  | 999.6  | 871.6 |
| 55°   | 758.6 | 756.7  | 768.9  | 825.9  | 871.6  | 873.5  | 925.8  | 952.0  | 1023.0 | 1049.1 | 904.3 |
| 57.5° | 791.3 | 787.6  | 799.7  | 869.8  | 932.4  | 933.3  | 994.0  | 1023.9 | 1081.8 | 1093.1 | 925.8 |
| 60°   | 818.4 | 818.4  | 834.3  | 912.8  | 999.6  | 1009.9 | 1065.0 | 1088.4 | 1138.8 | 1124.8 | 936.1 |
| 62.5° | 843.6 | 848.3  | 870.7  | 969.7  | 1079.0 | 1087.5 | 1143.5 | 1152.8 | 1197.7 | 1149.1 | 924.9 |
| 65°   | 873.5 | 881.0  | 924.0  | 1037.9 | 1173.4 | 1179.0 | 1225.7 | 1238.8 | 1256.5 | 1148.2 | 876.3 |
| 67.5° | 905.3 | 917.4  | 974.4  | 1114.5 | 1277.1 | 1292.1 | 1342.5 | 1329.4 | 1295.8 | 1111.7 | 774.5 |
| 70°   | 948.3 | 963.2  | 1044.5 | 1216.4 | 1419.1 | 1437.8 | 1504.1 | 1423.8 | 1275.2 | 981.9  | 627.8 |
| 72.5° | 980.9 | 1000.6 | 1111.7 | 1348.1 | 1611.6 | 1640.5 | 1624.6 | 1425.6 | 1143.5 | 782.9  | 420.4 |
| 75°   | 860.4 | 890.3  | 1058.5 | 1369.6 | 1693.8 | 1706.9 | 1536.8 | 1205.2 | 810.0  | 404.5  | 181.2 |
| 77.5° | 628.7 | 626.9  | 773.5  | 1064.1 | 1388.3 | 1353.7 | 1165.9 | 783.8  | 384.9  | 146.7  | 91.6  |
| 80°   | 315.8 | 303.6  | 418.5  | 567.1  | 749.3  | 772.6  | 689.5  | 407.3  | 152.3  | 78.5   | 55.1  |
| 82.5° | 116.8 | 119.6  | 153.2  | 231.7  | 376.5  | 382.1  | 278.4  | 172.8  | 83.1   | 41.1   | 29.0  |
| 85°   | 44.8  | 46.7   | 50.4   | 50.4   | 70.1   | 77.5   | 71.9   | 69.1   | 28.0   | 14.0   | 15.9  |
| 87.5° | 0.0   | 0.0    | 0.0    | 0.0    | 0.9    | 0.9    | 0.9    | 0.9    | 0.9    | 0.9    | 0.9   |
| 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: IST-SA1A-735-U-SL4

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 456.8 | 456.8 | 456.8 | 456.8 | 456.8 | 456.8 | 456.8 | 456.8 | 456.8 | 456.8 | 456.8 |
| 2.5°  | 454.0 | 452.2 | 448.4 | 441.9 | 438.2 | 435.4 | 431.6 | 427.9 | 426.9 | 426.0 | 430.7 |
| 5°    | 442.8 | 440.0 | 430.7 | 422.3 | 412.9 | 405.5 | 398.0 | 391.4 | 387.7 | 386.8 | 388.6 |
| 7.5°  | 431.6 | 427.9 | 413.9 | 397.1 | 381.2 | 368.1 | 355.0 | 348.5 | 338.2 | 338.2 | 339.1 |
| 10°   | 425.1 | 418.5 | 398.9 | 373.7 | 353.1 | 329.8 | 313.9 | 298.0 | 291.5 | 286.8 | 284.9 |
| 12.5° | 421.3 | 411.1 | 384.9 | 356.9 | 325.1 | 294.3 | 272.8 | 253.2 | 242.9 | 235.4 | 235.4 |
| 15°   | 422.3 | 411.1 | 375.6 | 339.1 | 298.0 | 260.7 | 233.6 | 212.1 | 199.0 | 191.5 | 189.7 |
| 17.5° | 421.3 | 407.3 | 364.4 | 316.7 | 270.9 | 231.7 | 199.0 | 176.6 | 163.5 | 158.8 | 157.9 |
| 20°   | 423.2 | 404.5 | 351.3 | 296.2 | 244.8 | 202.7 | 169.1 | 148.5 | 141.1 | 137.3 | 136.4 |
| 22.5° | 424.1 | 398.9 | 338.2 | 273.7 | 216.7 | 175.6 | 147.6 | 133.6 | 128.0 | 125.2 | 124.3 |
| 25°   | 426.0 | 398.0 | 323.2 | 253.2 | 193.4 | 155.1 | 133.6 | 121.5 | 118.6 | 116.8 | 116.8 |
| 27.5° | 433.5 | 398.0 | 310.2 | 227.0 | 169.1 | 138.3 | 121.5 | 114.0 | 112.1 | 111.2 | 111.2 |
| 30°   | 442.8 | 399.9 | 298.0 | 205.5 | 150.4 | 125.2 | 113.0 | 107.4 | 106.5 | 105.6 | 105.6 |
| 32.5° | 458.7 | 406.4 | 284.0 | 185.0 | 134.5 | 115.8 | 106.5 | 101.8 | 100.0 | 100.0 | 100.0 |
| 35°   | 480.2 | 417.6 | 270.0 | 166.3 | 121.5 | 106.5 | 100.0 | 95.3  | 94.4  | 95.3  | 95.3  |
| 37.5° | 511.0 | 430.7 | 257.8 | 149.5 | 111.2 | 99.0  | 93.4  | 90.6  | 89.7  | 89.7  | 90.6  |
| 40°   | 549.3 | 454.0 | 245.7 | 136.4 | 103.7 | 92.5  | 88.8  | 85.9  | 85.0  | 85.9  | 85.9  |
| 42.5° | 591.4 | 479.3 | 235.4 | 123.3 | 96.2  | 87.8  | 83.1  | 81.3  | 80.3  | 81.3  | 82.2  |
| 45°   | 638.1 | 505.4 | 227.0 | 114.0 | 90.6  | 83.1  | 79.4  | 78.5  | 77.5  | 77.5  | 78.5  |
| 47.5° | 677.3 | 533.4 | 220.5 | 107.4 | 85.9  | 79.4  | 76.6  | 74.7  | 73.8  | 72.9  | 73.8  |
| 50°   | 713.8 | 554.9 | 218.6 | 103.7 | 83.1  | 75.7  | 72.9  | 71.0  | 70.1  | 69.1  | 70.1  |
| 52.5° | 740.9 | 566.1 | 218.6 | 100.9 | 80.3  | 72.9  | 70.1  | 68.2  | 67.3  | 65.4  | 66.3  |
| 55°   | 759.5 | 571.8 | 215.8 | 99.0  | 77.5  | 70.1  | 66.3  | 65.4  | 64.5  | 62.6  | 62.6  |
| 57.5° | 770.7 | 570.8 | 205.5 | 98.1  | 76.6  | 66.3  | 63.5  | 62.6  | 61.7  | 59.8  | 59.8  |
| 60°   | 768.9 | 553.1 | 186.8 | 94.4  | 74.7  | 63.5  | 59.8  | 59.8  | 59.8  | 57.9  | 57.9  |
| 62.5° | 741.8 | 503.6 | 156.0 | 88.8  | 72.9  | 60.7  | 56.1  | 57.9  | 58.9  | 57.0  | 57.0  |
| 65°   | 668.9 | 427.9 | 128.9 | 81.3  | 68.2  | 57.9  | 53.3  | 56.1  | 57.9  | 57.0  | 56.1  |
| 67.5° | 563.3 | 339.1 | 106.5 | 73.8  | 63.5  | 54.2  | 49.5  | 53.3  | 54.2  | 54.2  | 54.2  |
| 70°   | 435.4 | 243.8 | 87.8  | 64.5  | 57.0  | 48.6  | 44.8  | 46.7  | 47.6  | 47.6  | 48.6  |
| 72.5° | 257.8 | 145.7 | 71.9  | 55.1  | 48.6  | 42.0  | 39.2  | 40.2  | 39.2  | 39.2  | 39.2  |
| 75°   | 127.1 | 90.6  | 57.9  | 46.7  | 41.1  | 35.5  | 32.7  | 30.8  | 30.8  | 30.8  | 29.9  |
| 77.5° | 77.5  | 67.3  | 47.6  | 37.4  | 32.7  | 27.1  | 25.2  | 23.4  | 23.4  | 23.4  | 23.4  |
| 80°   | 55.1  | 52.3  | 36.4  | 28.0  | 22.4  | 19.6  | 18.7  | 17.8  | 17.8  | 16.8  | 16.8  |
| 82.5° | 34.6  | 39.2  | 27.1  | 18.7  | 14.9  | 14.0  | 13.1  | 12.1  | 11.2  | 10.3  | 10.3  |
| 85°   | 19.6  | 25.2  | 15.9  | 10.3  | 8.4   | 6.5   | 5.6   | 5.6   | 4.7   | 4.7   | 3.7   |
| 87.5° | 0.9   | 1.9   | 1.9   | 1.9   | 1.9   | 0.9   | 0.9   | 0.9   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



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

Report Prepared for

Cooper Lighting Solutions

All Brands

Data applicable to all product families using SA light engines

Report Number: SP1-2101-121-7

Luminaire Tested: IFLD-S-SA2A-735-U-T2

Test Date: 03/04/2021

**Test Information**

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

PROGRAMMED @ 615mA.

**Spectral Parameters**

CCT (K): 3388  
 CIE u': 0.2371  
 CIE v': 0.5177  
 Duv: 0.0032  
 CIE x: 0.4153  
 CIE y: 0.4030  
 CIE z: 0.1817  
 Peak Wavelength (nm): 590  
 Dominant Wavelength (nm): 580  
 Purity: 45.7  
  
 Rf: 76.9  
 Rg: 94.4

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

**Test Conditions**

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



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

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CIE 1931 Chromaticity Diagram



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



CCT = 3388K  
 CIE x = 0.4153  
 CIE y = 0.4030  
 Duv = 0.0032

Point lies inside the ANSI 3500K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

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

REPORT NUMBER: SP1-2101-121-7

**Scotopic Flux vs. Wavelength**



**Scotopic Lumens: 12126**

**S/P: 1.36**

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 2672                                 | 0.0                            | 490               | 34553                                | 53.2                           | 620               | 136720                               | 1.7                            | 750               | 5870                                 | 0.0                            | 880               | 4216                                 | 0.0                            |
| 365               | 2252                                 | 0.0                            | 495               | 44336                                | 71.7                           | 625               | 126308                               | 1.1                            | 755               | 5421                                 | 0.0                            | 885               | 4132                                 | 0.0                            |
| 370               | 2217                                 | 0.0                            | 500               | 54643                                | 91.4                           | 630               | 114625                               | 0.6                            | 760               | 5097                                 | 0.0                            | 890               | 3992                                 | 0.0                            |
| 375               | 2697                                 | 0.0                            | 505               | 64676                                | 110.0                          | 635               | 103216                               | 0.4                            | 765               | 4626                                 | 0.0                            | 895               | 3214                                 | 0.0                            |
| 380               | 3039                                 | 0.0                            | 510               | 73825                                | 125.1                          | 640               | 92605                                | 0.2                            | 770               | 3782                                 | 0.0                            | 900               | 2580                                 | 0.0                            |
| 385               | 2655                                 | 0.0                            | 515               | 81872                                | 135.7                          | 645               | 83234                                | 0.1                            | 775               | 3506                                 | 0.0                            | 905               | 1776                                 | 0.0                            |
| 390               | 2357                                 | 0.0                            | 520               | 88574                                | 140.8                          | 650               | 73263                                | 0.1                            | 780               | 3507                                 | 0.0                            | 910               | 3995                                 | 0.0                            |
| 395               | 2186                                 | 0.0                            | 525               | 93289                                | 139.6                          | 655               | 64627                                | 0.1                            | 785               | 3267                                 | 0.0                            | 915               | 4288                                 | 0.0                            |
| 400               | 2015                                 | 0.0                            | 530               | 98393                                | 135.7                          | 660               | 56614                                | 0.0                            | 790               | 2849                                 | 0.0                            | 920               | 2446                                 | 0.0                            |
| 405               | 2234                                 | 0.1                            | 535               | 103269                               | 128.7                          | 665               | 49537                                | 0.0                            | 795               | 3037                                 | 0.0                            | 925               | 3009                                 | 0.0                            |
| 410               | 3412                                 | 0.2                            | 540               | 107316                               | 118.6                          | 670               | 42866                                | 0.0                            | 800               | 2716                                 | 0.0                            | 930               | 3026                                 | 0.0                            |
| 415               | 6135                                 | 0.6                            | 545               | 113101                               | 108.4                          | 675               | 36708                                | 0.0                            | 805               | 2648                                 | 0.0                            | 935               | 4734                                 | 0.0                            |
| 420               | 12146                                | 2.0                            | 550               | 120690                               | 98.7                           | 680               | 31814                                | 0.0                            | 810               | 3187                                 | 0.0                            | 940               | 3719                                 | 0.0                            |
| 425               | 23983                                | 5.9                            | 555               | 128583                               | 87.9                           | 685               | 27485                                | 0.0                            | 815               | 2931                                 | 0.0                            | 945               | 1480                                 | 0.0                            |
| 430               | 42142                                | 14.3                           | 560               | 137796                               | 77.0                           | 690               | 23698                                | 0.0                            | 820               | 2717                                 | 0.0                            | 950               | 3450                                 | 0.0                            |
| 435               | 68228                                | 30.5                           | 565               | 146577                               | 65.8                           | 695               | 20309                                | 0.0                            | 825               | 2236                                 | 0.0                            | 955               | 5051                                 | 0.0                            |
| 440               | 99323                                | 55.5                           | 570               | 154581                               | 54.6                           | 700               | 17890                                | 0.0                            | 830               | 2628                                 | 0.0                            | 960               | 3176                                 | 0.0                            |
| 445               | 115584                               | 77.4                           | 575               | 162633                               | 44.3                           | 705               | 15500                                | 0.0                            | 835               | 3140                                 | 0.0                            | 965               | 5178                                 | 0.0                            |
| 450               | 94997                                | 73.6                           | 580               | 168101                               | 34.6                           | 710               | 13699                                | 0.0                            | 840               | 3675                                 | 0.0                            | 970               | 6385                                 | 0.0                            |
| 455               | 61433                                | 53.7                           | 585               | 173145                               | 26.5                           | 715               | 12398                                | 0.0                            | 845               | 3283                                 | 0.0                            | 975               | 3810                                 | 0.0                            |
| 460               | 43373                                | 41.9                           | 590               | 174675                               | 19.5                           | 720               | 11147                                | 0.0                            | 850               | 3055                                 | 0.0                            | 980               | 4322                                 | 0.0                            |
| 465               | 32472                                | 34.3                           | 595               | 173724                               | 13.9                           | 725               | 9761                                 | 0.0                            | 855               | 2932                                 | 0.0                            | 985               | 4200                                 | 0.0                            |
| 470               | 24257                                | 27.9                           | 600               | 171241                               | 9.7                            | 730               | 8651                                 | 0.0                            | 860               | 3382                                 | 0.0                            | 990               | 4661                                 | 0.0                            |
| 475               | 21690                                | 27.1                           | 605               | 165134                               | 6.5                            | 735               | 7730                                 | 0.0                            | 865               | 2605                                 | 0.0                            | 995               | 6746                                 | 0.0                            |
| 480               | 23173                                | 31.3                           | 610               | 156652                               | 4.2                            | 740               | 6847                                 | 0.0                            | 870               | 3325                                 | 0.0                            | 1000              | 4150                                 | 0.0                            |
| 485               | 27564                                | 40.0                           | 615               | 147879                               | 2.7                            | 745               | 6124                                 | 0.0                            | 875               | 3325                                 | 0.0                            |                   |                                      |                                |

REPORT NUMBER: SP1-2101-121-7

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 4490.7 M/P: 0.5**

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2672          | 0.0           | 490    | 34553         | 28.8          | 620    | 136720        | 0.1           | 750    | 5870          | 0.0           | 880    | 4216          | 0.0           |
| 365    | 2252          | 0.0           | 495    | 44336         | 36.6          | 625    | 126308        | 0.1           | 755    | 5421          | 0.0           | 885    | 4132          | 0.0           |
| 370    | 2217          | 0.0           | 500    | 54643         | 43.9          | 630    | 114625        | 0.0           | 760    | 5097          | 0.0           | 890    | 3992          | 0.0           |
| 375    | 2697          | 0.0           | 505    | 64676         | 49.6          | 635    | 103216        | 0.0           | 765    | 4626          | 0.0           | 895    | 3214          | 0.0           |
| 380    | 3039          | 0.0           | 510    | 73825         | 53.0          | 640    | 92605         | 0.0           | 770    | 3782          | 0.0           | 900    | 2580          | 0.0           |
| 385    | 2655          | 0.0           | 515    | 81872         | 53.5          | 645    | 83234         | 0.0           | 775    | 3506          | 0.0           | 905    | 1776          | 0.0           |
| 390    | 2357          | 0.0           | 520    | 88574         | 51.6          | 650    | 73263         | 0.0           | 780    | 3507          | 0.0           | 910    | 3995          | 0.0           |
| 395    | 2186          | 0.0           | 525    | 93289         | 47.3          | 655    | 64627         | 0.0           | 785    | 3267          | 0.0           | 915    | 4288          | 0.0           |
| 400    | 2015          | 0.0           | 530    | 98393         | 42.5          | 660    | 56614         | 0.0           | 790    | 2849          | 0.0           | 920    | 2446          | 0.0           |
| 405    | 2234          | 0.0           | 535    | 103269        | 37.2          | 665    | 49537         | 0.0           | 795    | 3037          | 0.0           | 925    | 3009          | 0.0           |
| 410    | 3412          | 0.1           | 540    | 107316        | 31.4          | 670    | 42866         | 0.0           | 800    | 2716          | 0.0           | 930    | 3026          | 0.0           |
| 415    | 6135          | 0.4           | 545    | 113101        | 26.3          | 675    | 36708         | 0.0           | 805    | 2648          | 0.0           | 935    | 4734          | 0.0           |
| 420    | 12146         | 1.4           | 550    | 120690        | 21.7          | 680    | 31814         | 0.0           | 810    | 3187          | 0.0           | 940    | 3719          | 0.0           |
| 425    | 23983         | 3.7           | 555    | 128583        | 17.3          | 685    | 27485         | 0.0           | 815    | 2931          | 0.0           | 945    | 1480          | 0.0           |
| 430    | 42142         | 8.9           | 560    | 137796        | 13.6          | 690    | 23698         | 0.0           | 820    | 2717          | 0.0           | 950    | 3450          | 0.0           |
| 435    | 68228         | 18.2          | 565    | 146577        | 10.3          | 695    | 20309         | 0.0           | 825    | 2236          | 0.0           | 955    | 5051          | 0.0           |
| 440    | 99323         | 33.2          | 570    | 154581        | 7.6           | 700    | 17890         | 0.0           | 830    | 2628          | 0.0           | 960    | 3176          | 0.0           |
| 445    | 115584        | 45.6          | 575    | 162633        | 5.4           | 705    | 15500         | 0.0           | 835    | 3140          | 0.0           | 965    | 5178          | 0.0           |
| 450    | 94997         | 43.8          | 580    | 168101        | 3.8           | 710    | 13699         | 0.0           | 840    | 3675          | 0.0           | 970    | 6385          | 0.0           |
| 455    | 61433         | 32.2          | 585    | 173145        | 2.6           | 715    | 12398         | 0.0           | 845    | 3283          | 0.0           | 975    | 3810          | 0.0           |
| 460    | 43373         | 25.6          | 590    | 174675        | 1.7           | 720    | 11147         | 0.0           | 850    | 3055          | 0.0           | 980    | 4322          | 0.0           |
| 465    | 32472         | 21.2          | 595    | 173724        | 1.1           | 725    | 9761          | 0.0           | 855    | 2932          | 0.0           | 985    | 4200          | 0.0           |
| 470    | 24257         | 17.4          | 600    | 171241        | 0.7           | 730    | 8651          | 0.0           | 860    | 3382          | 0.0           | 990    | 4661          | 0.0           |
| 475    | 21690         | 16.6          | 605    | 165134        | 0.5           | 735    | 7730          | 0.0           | 865    | 2605          | 0.0           | 995    | 6746          | 0.0           |
| 480    | 23173         | 18.6          | 610    | 156652        | 0.3           | 740    | 6847          | 0.0           | 870    | 3325          | 0.0           | 1000   | 4150          | 0.0           |
| 485    | 27564         | 22.7          | 615    | 147879        | 0.2           | 745    | 6124          | 0.0           | 875    | 3325          | 0.0           |        |               |               |

**Summary**

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



**Color Vector Graphics**





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

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



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)