

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: STREETWORKS

Report Number: P348820

Luminaire Tested: **ARCH-N-PA1-10-740-24VDC-T3-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P348820  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-15)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-N-PA1-10-740-24VDC-T3-HSS  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 70 CRI, 4000K, 270mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1578 lumens  
Efficiency: N/A  
Efficacy: 112.7 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G0

Input Watts (W): 14  
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: 25 FT

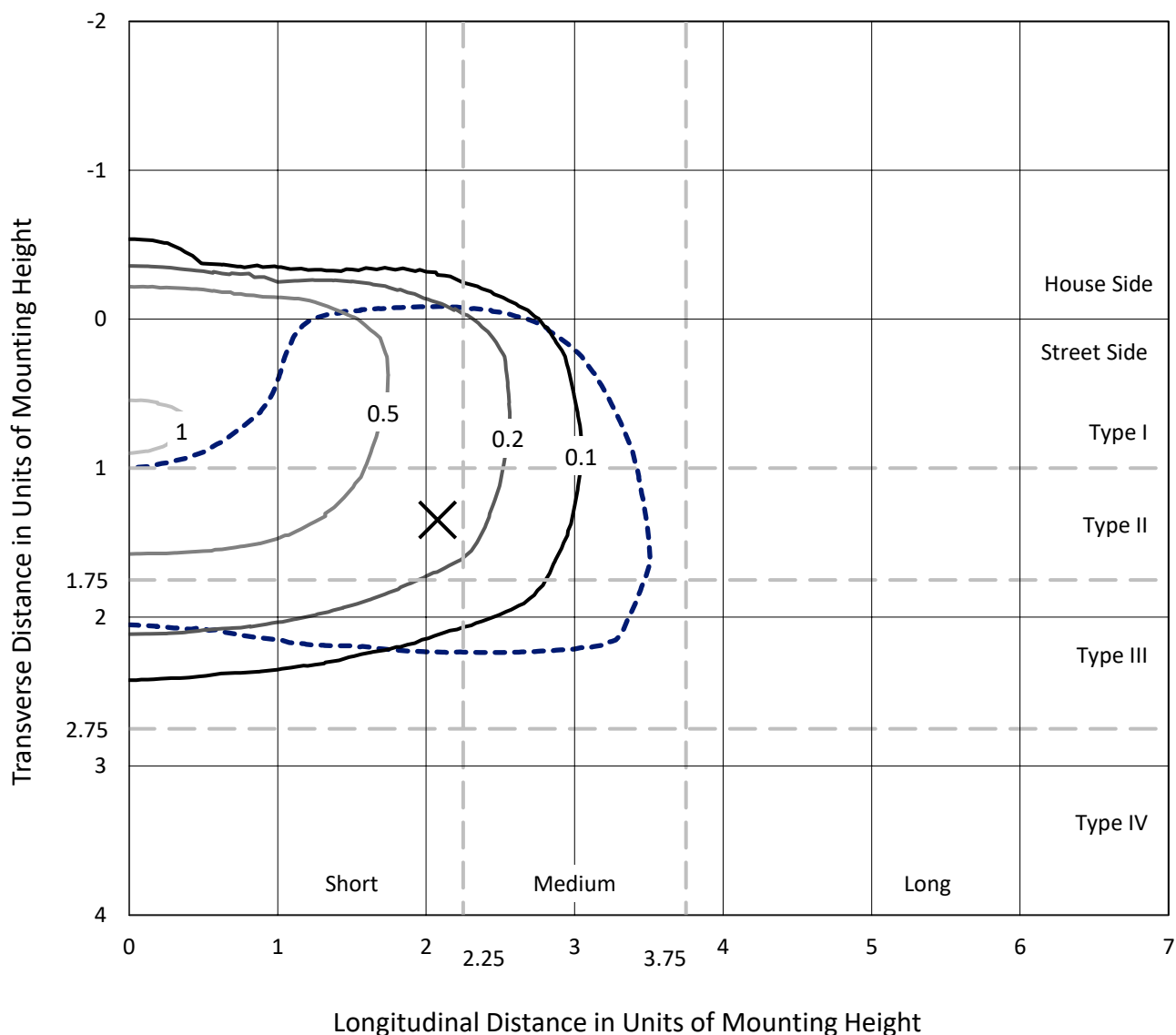
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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd



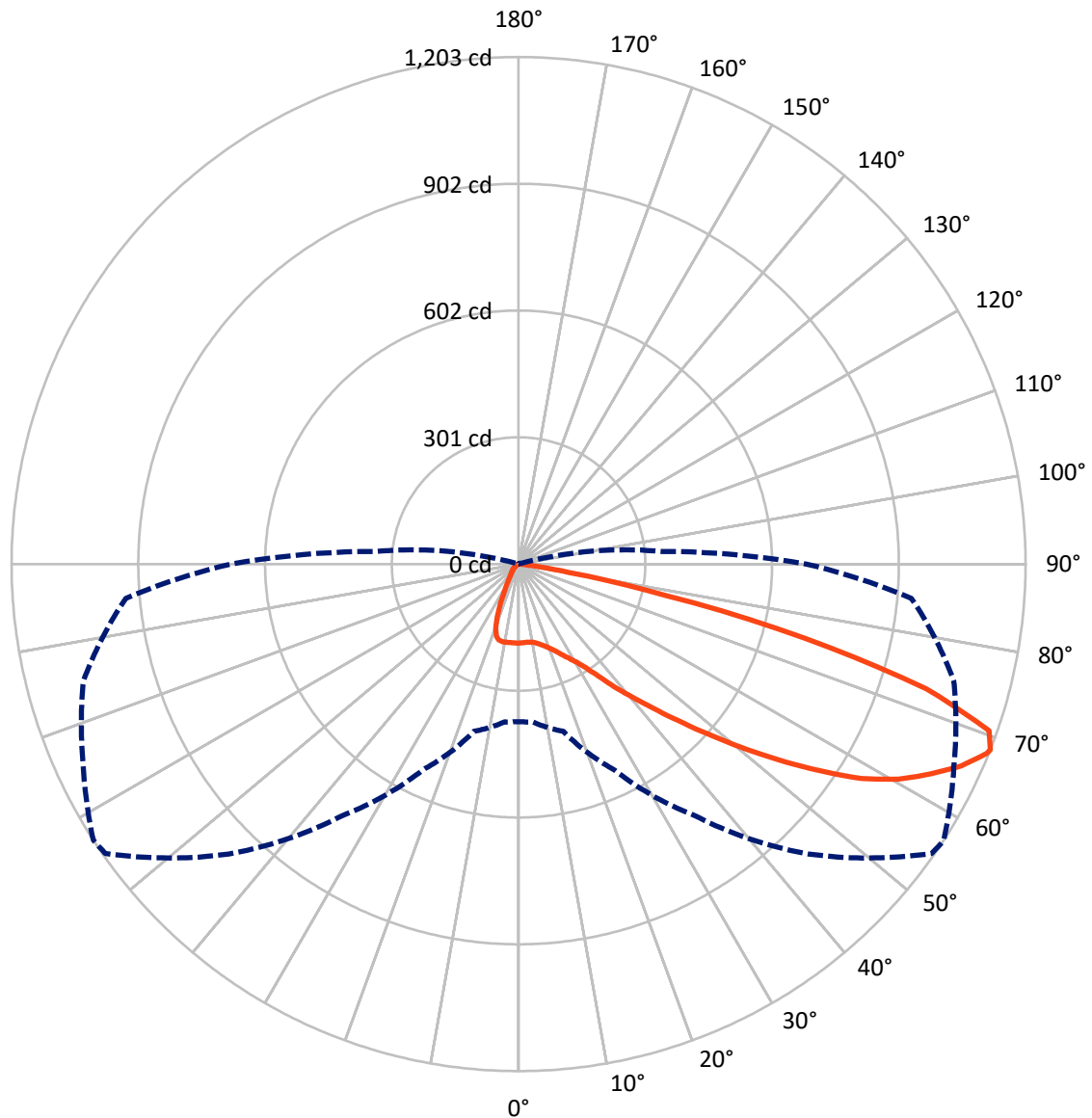
Based on 15 foot mounting height. Maximum calculated value = 1.1 fc

Type III - Short - N/A

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CATALOG NUMBER: ARCH-N-PA1-10-740-24VDC-T3-HSS

## Luminous Intensity Polar Plot



— Vertical Plane Through 57-Deg Lateral      - - - Horizontal Cone Through 68-Deg Vertical

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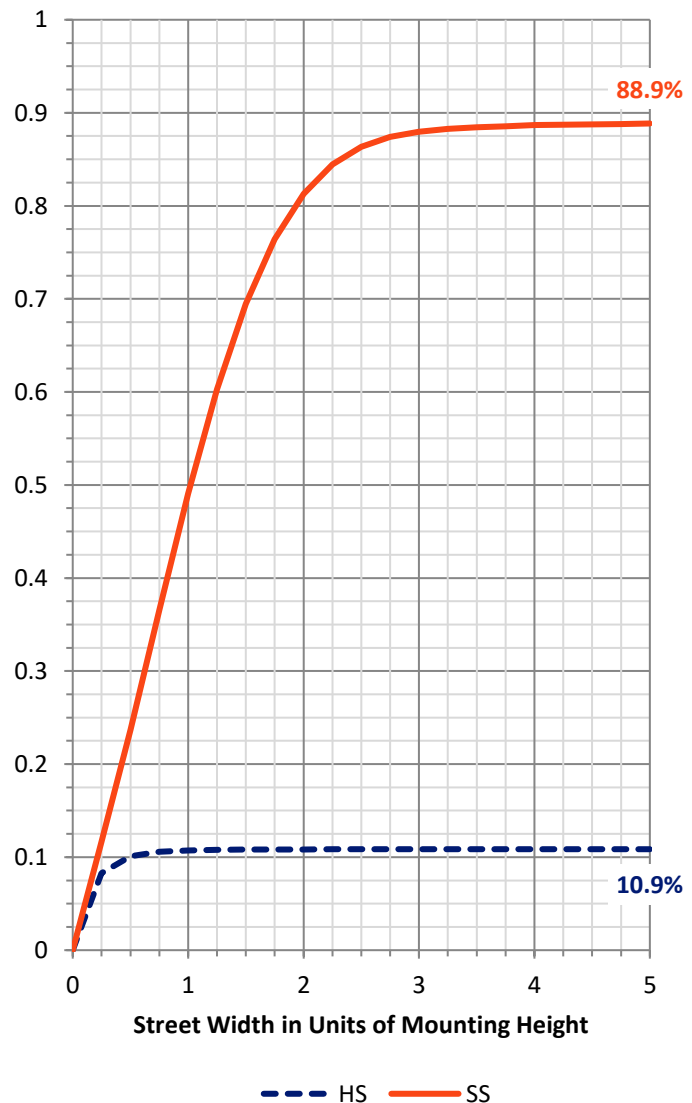
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 173.0    | 0.0    | 173.0  |
|                    | % Fixture | 11.0     | 0.0    | 11.0   |
| <b>Street Side</b> | Lumens    | 1405.0   | 0.0    | 1405.0 |
|                    | % Fixture | 89.0     | 0.0    | 89.0   |
| <b>Total</b>       | Lumens    | 1578.0   | 0.0    | 1578.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 17.5   | 1.1       |
| 10°-20°   | 48.6   | 3.1       |
| 20°-30°   | 83.9   | 5.3       |
| 30°-40°   | 144.8  | 9.2       |
| 40°-50°   | 247.7  | 15.7      |
| 50°-60°   | 396.2  | 25.1      |
| 60°-70°   | 457.8  | 29.0      |
| 70°-80°   | 174.9  | 11.1      |
| 80°-90°   | 6.6    | 0.4       |
| 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°    | 1578.0 | 100.0     |
| 0°-180°   | 1578.0 | 100.0     |



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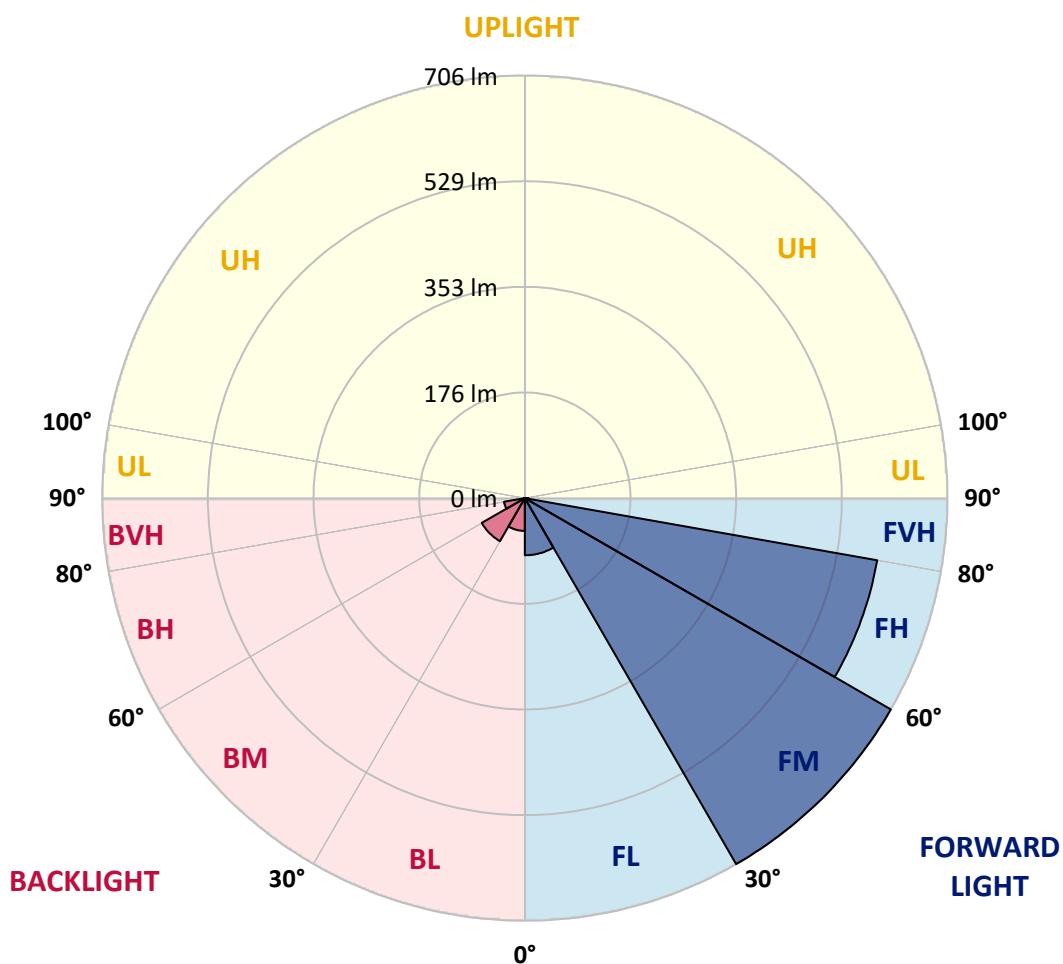
CATALOG NUMBER: ARCH-N-PA1-10-740-24VDC-T3-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|--------|-----------|-------------------------|------|--------|
|      |             |        |           | B                       | U    | G      |
| FL   | (0°-30°)    | 95.4   | 6.0       |                         |      |        |
| FM   | (30°-60°)   | 705.7  | 44.7      |                         |      |        |
| FH   | (60°-80°)   | 597.5  | 37.9      |                         |      | G0/660 |
| FVH  | (80°-90°)   | 6.4    | 0.4       |                         |      | G0/10  |
| BL   | (0°-30°)    | 54.7   | 3.5       | B0/110                  |      |        |
| BM   | (30°-60°)   | 83.0   | 5.3       | B0/220                  |      |        |
| BH   | (60°-80°)   | 35.2   | 2.2       | B0/110                  |      | G0/110 |
| BVH  | (80°-90°)   | 0.1    | 0.0       |                         |      | G0/10  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |        |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |        |

**BUG Rating: B0-U0-G0**

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°   | 45°    | 55°    | 57°    | 65°    | 75°    | 85°   |
|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|-------|
| 0°    | 187.5 | 187.5 | 187.5 | 187.5 | 187.5 | 187.5  | 187.5  | 187.5  | 187.5  | 187.5  | 187.5 |
| 2.5°  | 183.1 | 183.9 | 184.5 | 184.9 | 185.3 | 186.3  | 186.6  | 187.1  | 187.3  | 187.3  | 187.8 |
| 5°    | 175.9 | 176.8 | 178.0 | 179.1 | 181.2 | 183.9  | 185.8  | 186.5  | 187.9  | 189.1  | 189.7 |
| 7.5°  | 169.2 | 170.2 | 171.7 | 174.2 | 177.7 | 182.1  | 186.1  | 187.1  | 189.7  | 192.3  | 193.6 |
| 10°   | 164.8 | 165.6 | 167.6 | 171.1 | 175.8 | 181.8  | 187.5  | 188.8  | 193.3  | 197.5  | 199.9 |
| 12.5° | 163.3 | 164.1 | 166.1 | 170.0 | 175.9 | 183.0  | 190.8  | 192.7  | 199.2  | 205.4  | 208.8 |
| 15°   | 165.5 | 165.6 | 167.8 | 171.5 | 177.3 | 185.7  | 196.2  | 198.5  | 206.8  | 214.8  | 219.0 |
| 17.5° | 173.9 | 173.2 | 174.3 | 175.9 | 180.5 | 189.4  | 202.0  | 205.3  | 216.4  | 225.9  | 229.8 |
| 20°   | 194.7 | 194.7 | 192.2 | 187.7 | 187.8 | 195.0  | 209.7  | 213.5  | 227.1  | 238.0  | 241.6 |
| 22.5° | 230.5 | 229.8 | 224.7 | 213.8 | 203.7 | 204.8  | 219.2  | 224.1  | 239.9  | 251.6  | 252.8 |
| 25°   | 273.5 | 272.6 | 264.8 | 249.4 | 231.9 | 220.6  | 232.1  | 237.7  | 255.2  | 265.6  | 263.1 |
| 27.5° | 319.0 | 318.3 | 310.5 | 291.4 | 266.5 | 245.9  | 247.3  | 252.7  | 270.8  | 281.0  | 273.2 |
| 30°   | 363.1 | 363.3 | 355.6 | 335.9 | 307.8 | 278.0  | 266.7  | 269.9  | 285.9  | 296.3  | 285.1 |
| 32.5° | 405.0 | 405.3 | 398.7 | 376.7 | 350.4 | 315.4  | 293.6  | 292.8  | 303.5  | 313.8  | 300.9 |
| 35°   | 442.4 | 443.1 | 438.6 | 421.5 | 393.7 | 357.0  | 328.5  | 326.5  | 328.5  | 340.1  | 325.2 |
| 37.5° | 478.4 | 478.9 | 475.4 | 461.0 | 437.8 | 402.8  | 372.5  | 369.7  | 365.4  | 374.3  | 357.2 |
| 40°   | 517.9 | 516.8 | 512.8 | 499.8 | 479.8 | 453.3  | 419.8  | 415.0  | 407.5  | 415.4  | 399.3 |
| 42.5° | 554.6 | 553.3 | 554.0 | 539.2 | 522.4 | 505.2  | 474.9  | 466.7  | 462.3  | 471.4  | 450.9 |
| 45°   | 600.5 | 599.8 | 602.1 | 589.2 | 575.6 | 563.1  | 538.1  | 529.2  | 527.2  | 537.9  | 513.4 |
| 47.5° | 645.8 | 647.4 | 654.4 | 648.9 | 643.4 | 632.4  | 605.1  | 601.0  | 602.2  | 615.1  | 579.2 |
| 50°   | 683.5 | 685.5 | 704.5 | 710.8 | 718.8 | 712.4  | 684.9  | 682.4  | 687.1  | 698.8  | 650.1 |
| 52.5° | 710.9 | 714.8 | 738.5 | 767.3 | 796.4 | 800.8  | 773.4  | 771.1  | 777.5  | 779.3  | 704.9 |
| 55°   | 729.8 | 733.3 | 760.1 | 812.9 | 872.2 | 890.8  | 873.8  | 865.2  | 864.0  | 846.3  | 762.5 |
| 57.5° | 733.2 | 732.8 | 771.3 | 842.4 | 931.6 | 979.7  | 969.0  | 960.4  | 936.0  | 908.2  | 828.5 |
| 60°   | 714.2 | 716.4 | 761.1 | 852.6 | 968.9 | 1046.9 | 1047.7 | 1036.7 | 998.6  | 968.4  | 892.5 |
| 62.5° | 655.9 | 664.7 | 709.8 | 825.8 | 968.4 | 1074.0 | 1105.5 | 1097.1 | 1051.5 | 1017.8 | 957.5 |
| 65°   | 561.3 | 564.4 | 607.4 | 734.1 | 903.0 | 1062.7 | 1157.5 | 1154.4 | 1099.2 | 1065.7 | 990.8 |
| 67.5° | 409.9 | 403.1 | 448.3 | 578.0 | 764.5 | 996.6  | 1194.8 | 1198.8 | 1135.9 | 1075.5 | 955.3 |
| 68°   | 374.0 | 376.1 | 411.3 | 539.5 | 728.2 | 973.2  | 1197.3 | 1203.3 | 1139.6 | 1069.1 | 935.9 |
| 70°   | 223.0 | 226.8 | 258.2 | 371.4 | 554.0 | 841.1  | 1170.7 | 1184.5 | 1117.8 | 1002.9 | 809.5 |
| 72.5° | 56.9  | 61.6  | 91.3  | 166.2 | 316.4 | 592.6  | 988.3  | 1011.6 | 970.5  | 813.6  | 546.5 |
| 75°   | 23.4  | 24.6  | 32.6  | 54.8  | 117.9 | 267.0  | 651.4  | 701.4  | 672.8  | 487.1  | 247.0 |
| 77.5° | 16.2  | 17.0  | 21.0  | 30.4  | 51.0  | 90.5   | 319.4  | 355.5  | 320.2  | 166.2  | 53.9  |
| 80°   | 11.6  | 12.3  | 15.0  | 20.2  | 29.3  | 32.3   | 104.1  | 120.4  | 95.6   | 36.5   | 13.4  |
| 82.5° | 6.9   | 7.5   | 11.2  | 14.4  | 17.8  | 15.4   | 25.9   | 29.4   | 27.7   | 18.1   | 6.0   |
| 85°   | 3.4   | 4.0   | 7.5   | 10.3  | 9.6   | 6.5    | 7.9    | 8.8    | 10.9   | 11.0   | 3.2   |
| 87.5° | 0.2   | 0.4   | 4.4   | 6.2   | 2.7   | 1.5    | 2.3    | 2.8    | 3.9    | 5.4    | 1.3   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   |



REPORT NUMBER: P348820

CATALOG NUMBER: ARCH-N-PA1-10-740-24VDC-T3-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 187.5 | 187.5 | 187.5 | 187.5 | 187.5 | 187.5 | 187.5 | 187.5 | 187.5 | 187.5 | 187.5 |
| 2.5°  | 188.0 | 188.1 | 187.6 | 187.4 | 187.5 | 186.6 | 186.2 | 186.4 | 186.4 | 186.6 | 186.2 |
| 5°    | 189.9 | 189.9 | 189.0 | 187.8 | 187.1 | 185.4 | 184.3 | 184.0 | 183.8 | 183.6 | 183.3 |
| 7.5°  | 193.9 | 193.5 | 191.9 | 189.3 | 187.1 | 183.3 | 180.5 | 179.0 | 178.3 | 178.0 | 177.7 |
| 10°   | 200.4 | 199.6 | 197.0 | 192.1 | 187.0 | 180.3 | 174.2 | 169.7 | 166.1 | 164.6 | 163.7 |
| 12.5° | 209.1 | 208.0 | 203.6 | 195.5 | 186.5 | 174.2 | 160.8 | 147.9 | 135.9 | 130.9 | 128.5 |
| 15°   | 219.2 | 217.5 | 210.6 | 198.3 | 183.4 | 160.4 | 131.2 | 108.6 | 92.0  | 85.7  | 83.0  |
| 17.5° | 229.4 | 227.2 | 216.7 | 200.1 | 174.2 | 131.8 | 92.1  | 69.5  | 58.4  | 55.4  | 54.4  |
| 20°   | 239.7 | 236.5 | 222.0 | 198.8 | 153.5 | 95.1  | 60.7  | 50.8  | 47.6  | 46.7  | 46.4  |
| 22.5° | 249.5 | 244.4 | 226.8 | 193.6 | 121.5 | 63.8  | 48.1  | 44.9  | 43.9  | 43.4  | 43.2  |
| 25°   | 258.0 | 250.9 | 230.9 | 177.4 | 86.0  | 48.2  | 43.3  | 42.2  | 40.9  | 39.9  | 40.0  |
| 27.5° | 266.0 | 257.4 | 233.5 | 150.9 | 57.4  | 41.2  | 40.1  | 38.7  | 36.2  | 34.8  | 34.8  |
| 30°   | 275.6 | 266.1 | 235.3 | 116.1 | 42.2  | 36.4  | 35.5  | 33.4  | 30.0  | 28.1  | 28.1  |
| 32.5° | 290.1 | 279.2 | 234.1 | 81.5  | 35.0  | 32.0  | 29.9  | 26.9  | 23.3  | 21.5  | 21.4  |
| 35°   | 312.3 | 299.5 | 225.6 | 53.4  | 30.9  | 27.8  | 24.5  | 20.8  | 17.6  | 16.1  | 16.0  |
| 37.5° | 342.1 | 326.7 | 206.5 | 38.2  | 27.7  | 24.0  | 19.9  | 15.9  | 13.5  | 12.5  | 12.5  |
| 40°   | 380.8 | 358.2 | 179.2 | 31.0  | 24.7  | 20.2  | 15.4  | 12.3  | 10.7  | 9.9   | 10.0  |
| 42.5° | 427.3 | 392.0 | 146.5 | 26.7  | 21.8  | 16.6  | 12.0  | 9.7   | 8.7   | 8.1   | 8.0   |
| 45°   | 479.0 | 425.4 | 112.1 | 23.8  | 18.9  | 13.4  | 9.4   | 7.7   | 6.9   | 6.6   | 6.6   |
| 47.5° | 535.7 | 457.8 | 82.1  | 21.3  | 15.7  | 10.4  | 7.5   | 6.3   | 5.6   | 5.4   | 5.3   |
| 50°   | 587.3 | 480.4 | 59.2  | 18.6  | 12.9  | 8.2   | 6.1   | 5.2   | 4.8   | 4.5   | 4.5   |
| 52.5° | 630.3 | 487.5 | 43.6  | 15.7  | 10.4  | 6.6   | 5.1   | 4.5   | 4.0   | 3.8   | 3.8   |
| 55°   | 668.1 | 484.6 | 32.4  | 12.9  | 8.4   | 5.4   | 4.3   | 3.8   | 3.4   | 3.2   | 3.2   |
| 57.5° | 704.4 | 475.1 | 24.2  | 10.5  | 6.8   | 4.3   | 3.7   | 3.2   | 2.8   | 2.7   | 2.7   |
| 60°   | 734.0 | 459.5 | 18.0  | 8.5   | 5.4   | 3.5   | 3.1   | 2.6   | 2.3   | 2.1   | 2.1   |
| 62.5° | 758.0 | 442.2 | 13.2  | 7.0   | 4.3   | 2.8   | 2.4   | 2.2   | 1.7   | 1.5   | 1.5   |
| 65°   | 758.2 | 413.4 | 9.9   | 5.8   | 3.4   | 2.2   | 1.8   | 1.7   | 1.1   | 0.9   | 0.8   |
| 67.5° | 703.3 | 356.4 | 7.6   | 5.0   | 2.6   | 1.6   | 1.3   | 1.4   | 0.6   | 0.4   | 0.3   |
| 68°   | 683.4 | 342.0 | 7.2   | 4.9   | 2.5   | 1.6   | 1.3   | 1.4   | 0.5   | 0.3   | 0.2   |
| 70°   | 576.2 | 272.0 | 5.7   | 4.8   | 2.2   | 1.2   | 1.0   | 1.4   | 0.4   | 0.2   | 0.1   |
| 72.5° | 368.5 | 157.9 | 4.3   | 3.8   | 1.6   | 0.9   | 0.7   | 1.3   | 0.4   | 0.1   | 0.1   |
| 75°   | 156.8 | 48.9  | 2.9   | 2.7   | 1.0   | 0.7   | 0.4   | 0.8   | 0.3   | 0.1   | 0.0   |
| 77.5° | 33.1  | 11.0  | 1.7   | 1.6   | 0.7   | 0.4   | 0.3   | 0.2   | 0.1   | 0.0   | 0.0   |
| 80°   | 8.5   | 3.2   | 0.9   | 0.8   | 0.4   | 0.2   | 0.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 2.7   | 1.3   | 0.5   | 0.4   | 0.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 1.3   | 0.7   | 0.3   | 0.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 0.7   | 0.2   | 0.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-2

Luminaire Tested: IFLD-S-SA2A-740-U-T3R-HSS

Test Date: 03/05/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2A-740-U-T3R-HSS**  
 Description: STREETWORKS INF FLOOD

SHIELD, DRIVER PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 3905    | CRI (Ra): | 71.2 |      |       |
| CIE u':                   | 0.2273  | R1:       | 68.9 | R9:  | -29.7 |
| CIE v':                   | 0.5024  | R2:       | 77.0 | R10: | 46.2  |
| Duv:                      | -0.0008 | R3:       | 84.0 | R11: | 68.8  |
| CIE x:                    | 0.3841  | R4:       | 71.6 | R12: | 45.6  |
| CIE y:                    | 0.3774  | R5:       | 68.9 | R13: | 69.5  |
| CIE z:                    | 0.2385  | R6:       | 68.3 | R14: | 90.7  |
| Peak Wavelength (nm):     | 443     | R7:       | 78.7 |      |       |
| Dominant Wavelength (nm): | 579     | R8:       | 52.2 |      |       |
| Purity:                   | 28.7    |           |      |      |       |
| Rf:                       | 71.7    |           |      |      |       |
| Rg:                       | 96.9    |           |      |      |       |



### Test Conditions

Stabilization Time: 211M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.8/312%  
 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            |



REPORT NUMBER: SP1-2101-121-2

### 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       | 2304             | 0.0              | 490       | 19043            | 2.7              | 620       | 97577            | 25.4             | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 4.8              | 625       | 90158            | 19.9             | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 8.0              | 630       | 82240            | 14.9             | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 13.3             | 635       | 74361            | 11.2             | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 20.2             | 640       | 66994            | 8.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 28.5             | 645       | 60405            | 5.8              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 37.4             | 650       | 53806            | 3.9              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 44.9             | 655       | 47610            | 2.7              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 52.6             | 660       | 42018            | 1.8              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 58.4             | 665       | 36742            | 1.2              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.0              | 540       | 96845            | 63.1             | 670       | 32105            | 0.7              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.0              | 545       | 100829           | 67.1             | 675       | 27946            | 0.5              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 0.1              | 550       | 105648           | 71.8             | 680       | 24146            | 0.3              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 0.2              | 555       | 110017           | 75.1             | 685       | 21191            | 0.2              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 0.5              | 560       | 114586           | 77.9             | 690       | 18544            | 0.1              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 1.2              | 565       | 118987           | 79.1             | 695       | 16058            | 0.1              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 2.1              | 570       | 122326           | 79.5             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 2.9              | 575       | 125968           | 78.4             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 2.7              | 580       | 127613           | 75.8             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 2.0              | 585       | 129466           | 71.9             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 1.5              | 590       | 128813           | 66.6             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 1.3              | 595       | 126387           | 59.9             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 1.0              | 600       | 123477           | 53.2             | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 1.1              | 605       | 118718           | 46.0             | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 1.2              | 610       | 112091           | 38.5             | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 1.7              | 615       | 105039           | 31.7             | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Scotopic Flux vs. Wavelength



Scotopic Lumens: 10425.8

S/P: 1.47

| 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       | 2304             | 0.0              | 490       | 19043            | 29.3             | 620       | 97577            | 1.2              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 43.0             | 625       | 90158            | 0.8              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 60.8             | 630       | 82240            | 0.5              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 81.1             | 635       | 74361            | 0.3              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 99.6             | 640       | 66994            | 0.2              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 113.9            | 645       | 60405            | 0.1              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 122.6            | 650       | 53806            | 0.1              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 125.0            | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 123.1            | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.1              | 535       | 94097            | 117.3            | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 107.0            | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.9              | 545       | 100829           | 96.7             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 3.0              | 550       | 105648           | 86.4             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 9.3              | 555       | 110017           | 75.2             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 23.0             | 560       | 114586           | 64.0             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 45.7             | 565       | 118987           | 53.4             | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 75.5             | 570       | 122326           | 43.2             | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 93.8             | 575       | 125968           | 34.3             | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 79.3             | 580       | 127613           | 26.3             | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 51.3             | 585       | 129466           | 19.8             | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 35.6             | 590       | 128813           | 14.3             | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 26.0             | 595       | 126387           | 10.1             | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 19.3             | 600       | 123477           | 7.0              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 16.8             | 605       | 118718           | 4.7              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 17.7             | 610       | 112091           | 3.0              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 21.4             | 615       | 105039           | 1.9              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-2

### Melanopic Flux vs. Wavelength



Melanopic Lumens: 3927.2

M/P: 0.55

| 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       | 2304             | 0.0              | 490       | 19043            | 15.8             | 620       | 97577            | 0.1              | 750       | 4830             | 0.0              | 880       | 3505             | 0.0              |
| 365       | 2150             | 0.0              | 495       | 26606            | 22.0             | 625       | 90158            | 0.0              | 755       | 4664             | 0.0              | 885       | 2991             | 0.0              |
| 370       | 2146             | 0.0              | 500       | 36376            | 29.2             | 630       | 82240            | 0.0              | 760       | 4006             | 0.0              | 890       | 2327             | 0.0              |
| 375       | 2332             | 0.0              | 505       | 47714            | 36.6             | 635       | 74361            | 0.0              | 765       | 3715             | 0.0              | 895       | 2775             | 0.0              |
| 380       | 2527             | 0.0              | 510       | 58741            | 42.2             | 640       | 66994            | 0.0              | 770       | 3696             | 0.0              | 900       | 2141             | 0.0              |
| 385       | 2304             | 0.0              | 515       | 68716            | 44.9             | 645       | 60405            | 0.0              | 775       | 3117             | 0.0              | 905       | 2421             | 0.0              |
| 390       | 2064             | 0.0              | 520       | 77136            | 44.9             | 650       | 53806            | 0.0              | 780       | 3062             | 0.0              | 910       | 2200             | 0.0              |
| 395       | 1856             | 0.0              | 525       | 83567            | 42.4             | 655       | 47610            | 0.0              | 785       | 2907             | 0.0              | 915       | 2716             | 0.0              |
| 400       | 1856             | 0.0              | 530       | 89283            | 38.6             | 660       | 42018            | 0.0              | 790       | 2655             | 0.0              | 920       | 2656             | 0.0              |
| 405       | 2374             | 0.0              | 535       | 94097            | 33.9             | 665       | 36742            | 0.0              | 795       | 2467             | 0.0              | 925       | 2671             | 0.0              |
| 410       | 4084             | 0.2              | 540       | 96845            | 28.3             | 670       | 32105            | 0.0              | 800       | 2609             | 0.0              | 930       | 3292             | 0.0              |
| 415       | 8543             | 0.6              | 545       | 100829           | 23.4             | 675       | 27946            | 0.0              | 805       | 2293             | 0.0              | 935       | 3188             | 0.0              |
| 420       | 18394            | 2.1              | 550       | 105648           | 19.0             | 680       | 24146            | 0.0              | 810       | 2188             | 0.0              | 940       | 1997             | 0.0              |
| 425       | 37987            | 5.9              | 555       | 110017           | 14.8             | 685       | 21191            | 0.0              | 815       | 2386             | 0.0              | 945       | 2623             | 0.0              |
| 430       | 67605            | 14.3             | 560       | 114586           | 11.3             | 690       | 18544            | 0.0              | 820       | 2712             | 0.0              | 950       | 2969             | 0.0              |
| 435       | 102160           | 27.3             | 565       | 118987           | 8.4              | 695       | 16058            | 0.0              | 825       | 2473             | 0.0              | 955       | 2277             | 0.0              |
| 440       | 135103           | 45.1             | 570       | 122326           | 6.0              | 700       | 14133            | 0.0              | 830       | 1969             | 0.0              | 960       | 4267             | 0.0              |
| 445       | 140126           | 55.3             | 575       | 125968           | 4.2              | 705       | 12309            | 0.0              | 835       | 1917             | 0.0              | 965       | 2034             | 0.0              |
| 450       | 102339           | 47.2             | 580       | 127613           | 2.9              | 710       | 11142            | 0.0              | 840       | 2248             | 0.0              | 970       | 3586             | 0.0              |
| 455       | 58751            | 30.8             | 585       | 129466           | 1.9              | 715       | 10143            | 0.0              | 845       | 2266             | 0.0              | 975       | 2505             | 0.0              |
| 460       | 36892            | 21.7             | 590       | 128813           | 1.3              | 720       | 9072             | 0.0              | 850       | 2558             | 0.0              | 980       | 2666             | 0.0              |
| 465       | 24637            | 16.1             | 595       | 126387           | 0.8              | 725       | 8130             | 0.0              | 855       | 2767             | 0.0              | 985       | 2934             | 0.0              |
| 470       | 16738            | 12.0             | 600       | 123477           | 0.5              | 730       | 7149             | 0.0              | 860       | 2826             | 0.0              | 990       | 4120             | 0.0              |
| 475       | 13456            | 10.3             | 605       | 118718           | 0.3              | 735       | 6311             | 0.0              | 865       | 2385             | 0.0              | 995       | 3858             | 0.0              |
| 480       | 13081            | 10.5             | 610       | 112091           | 0.2              | 740       | 5711             | 0.0              | 870       | 3194             | 0.0              | 1000      | 3405             | 0.0              |
| 485       | 14734            | 12.1             | 615       | 105039           | 0.1              | 745       | 5111             | 0.0              | 875       | 3189             | 0.0              |           |                  |                  |

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TM-30-18

### Summary

$R_f = 71.7$   
 $R_g = 96.9$   
 CIE  $R_a = 71.2$   
 $R_g = -29.7$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 86 | CES76 = 45 |
| CES02 = 61 | CES27 = 80 | CES52 = 87 | CES77 = 68 |
| CES03 = 30 | CES28 = 79 | CES53 = 74 | CES78 = 49 |
| CES04 = 70 | CES29 = 51 | CES54 = 81 | CES79 = 77 |
| CES05 = 47 | CES30 = 60 | CES55 = 80 | CES80 = 75 |
| CES06 = 50 | CES31 = 56 | CES56 = 69 | CES81 = 75 |
| CES07 = 40 | CES32 = 52 | CES57 = 67 | CES82 = 90 |
| CES08 = 39 | CES33 = 62 | CES58 = 69 | CES83 = 85 |
| CES09 = 29 | CES34 = 65 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 81 | CES60 = 91 | CES85 = 83 |
| CES11 = 57 | CES36 = 92 | CES61 = 85 | CES86 = 72 |
| CES12 = 63 | CES37 = 74 | CES62 = 81 | CES87 = 77 |
| CES13 = 42 | CES38 = 69 | CES63 = 72 | CES88 = 77 |
| CES14 = 74 | CES39 = 92 | CES64 = 69 | CES89 = 72 |
| CES15 = 71 | CES40 = 86 | CES65 = 64 | CES90 = 75 |
| CES16 = 46 | CES41 = 84 | CES66 = 63 | CES91 = 91 |
| CES17 = 49 | CES42 = 75 | CES67 = 60 | CES92 = 66 |
| CES18 = 56 | CES43 = 70 | CES68 = 67 | CES93 = 80 |
| CES19 = 72 | CES44 = 98 | CES69 = 77 | CES94 = 56 |
| CES20 = 65 | CES45 = 80 | CES70 = 57 | CES95 = 72 |
| CES21 = 86 | CES46 = 77 | CES71 = 53 | CES96 = 78 |
| CES22 = 78 | CES47 = 74 | CES72 = 84 | CES97 = 83 |
| CES23 = 92 | CES48 = 66 | CES73 = 47 | CES98 = 73 |
| CES24 = 91 | CES49 = 76 | CES74 = 96 | CES99 = 63 |
| CES25 = 72 | CES50 = 85 | CES75 = 52 |            |



Color Rendition by Hue-Angle Bin



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**TM-30-18**

**Measure Comparisons**



(END OF REPORT)