

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: P438941

Luminaire Tested: **IST-SA1F-827-U-SL3-HSS**

Issue Date: 12/10/2020

Test Information

Test Method: LM-79-08
Report Number: P438941
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-17)
Test Lab: INNOVATION CENTER
Issue Date: 12/10/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: MCGRAW-EDISON
Catalog Number: IST-SA1F-827-U-SL3-HSS
Description: IMPACT ELITE LED TRAPEZOID LUMINAIRE
(1) 80 CRI, 2700K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE III SPILL
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 4712 lumens
Efficiency: N/A
Efficacy: 71.4 lumens/watt
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')
IES Classification: Type III - Short
BUG Rating: B1 - U0 - G1

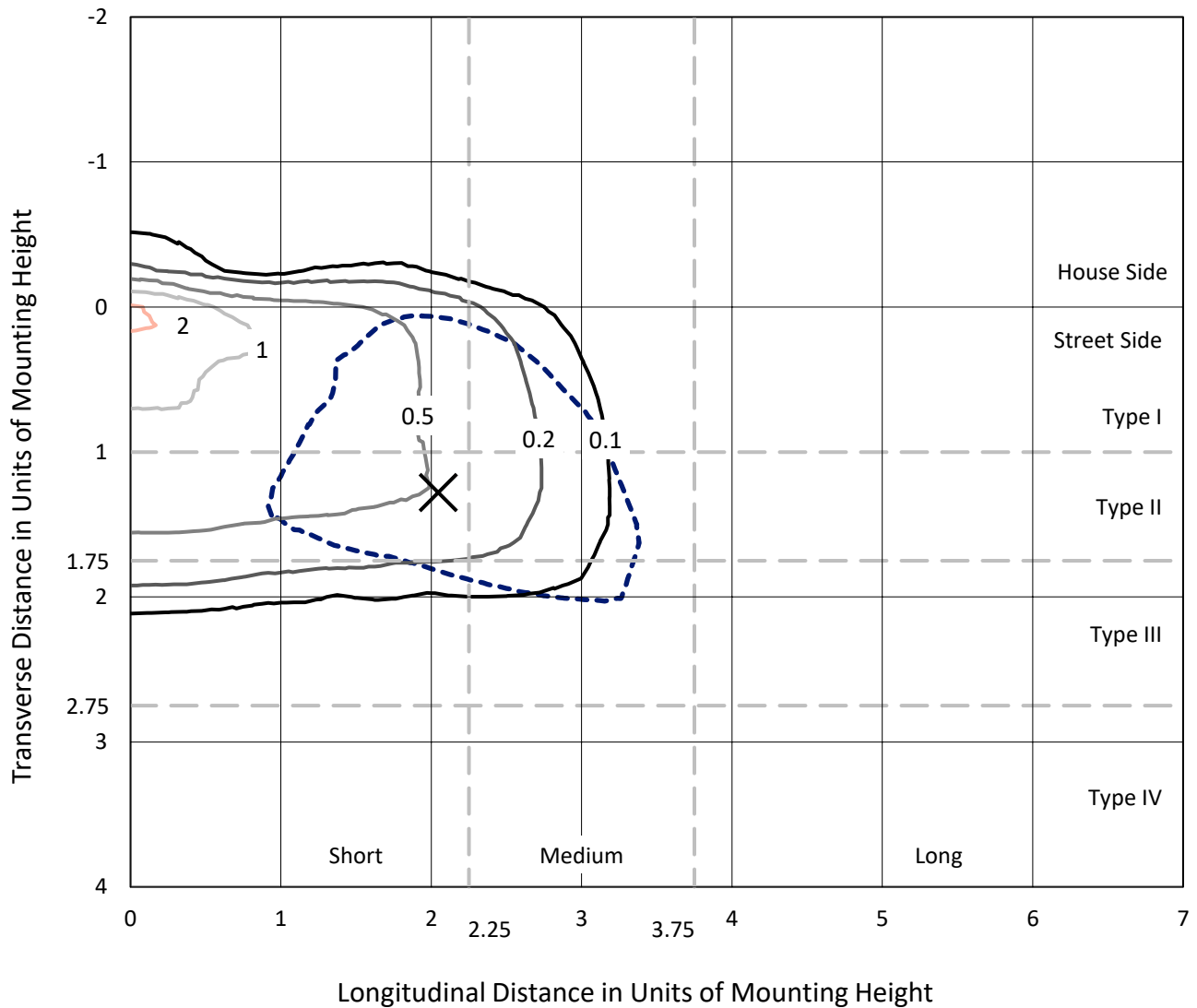
Input Watts (W): 66
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



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Iso-Footcandle Lines of Horizontal Illumination

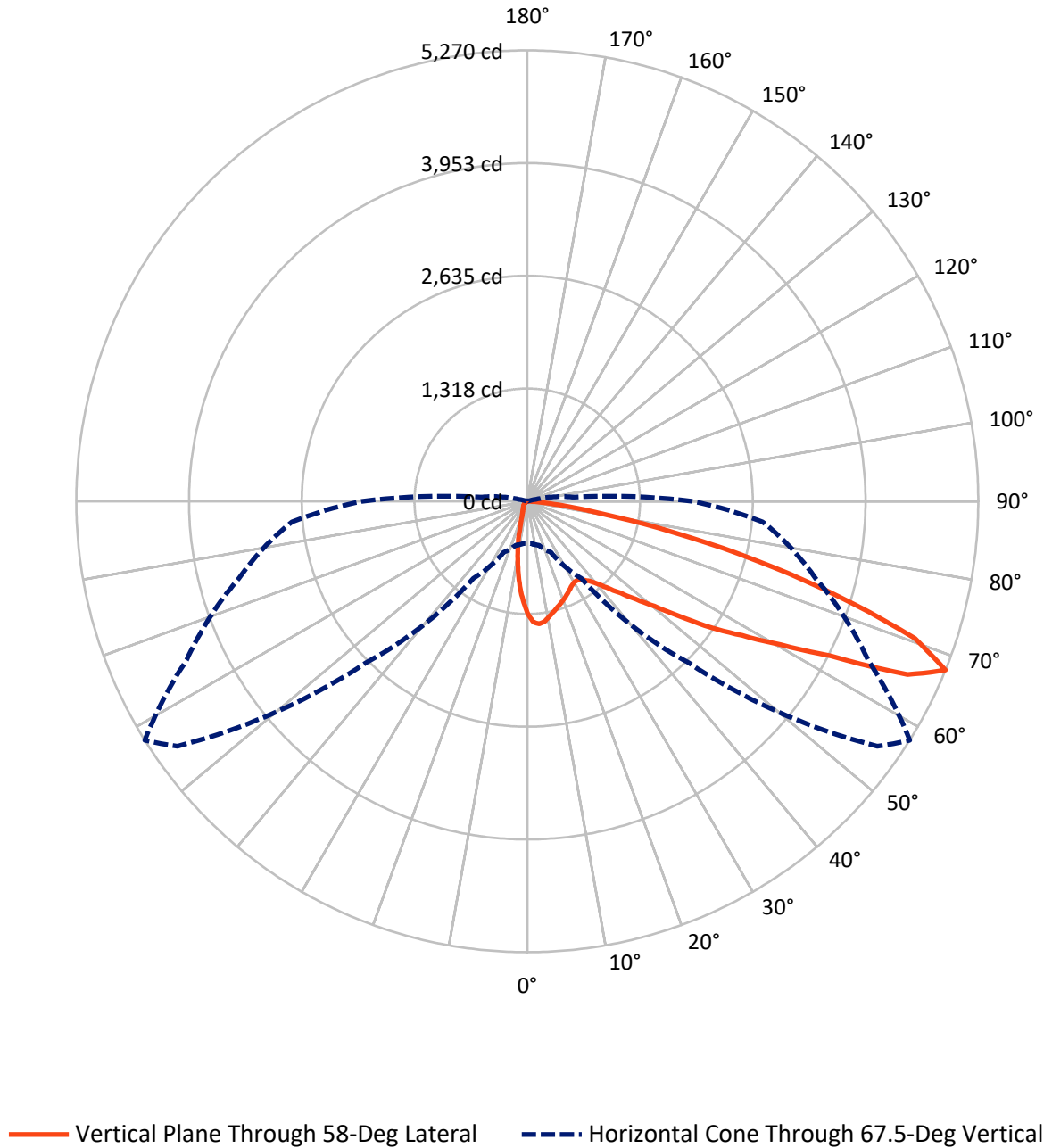
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.2 fc
 Type III - Short - N/A

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Luminous Intensity Polar Plot



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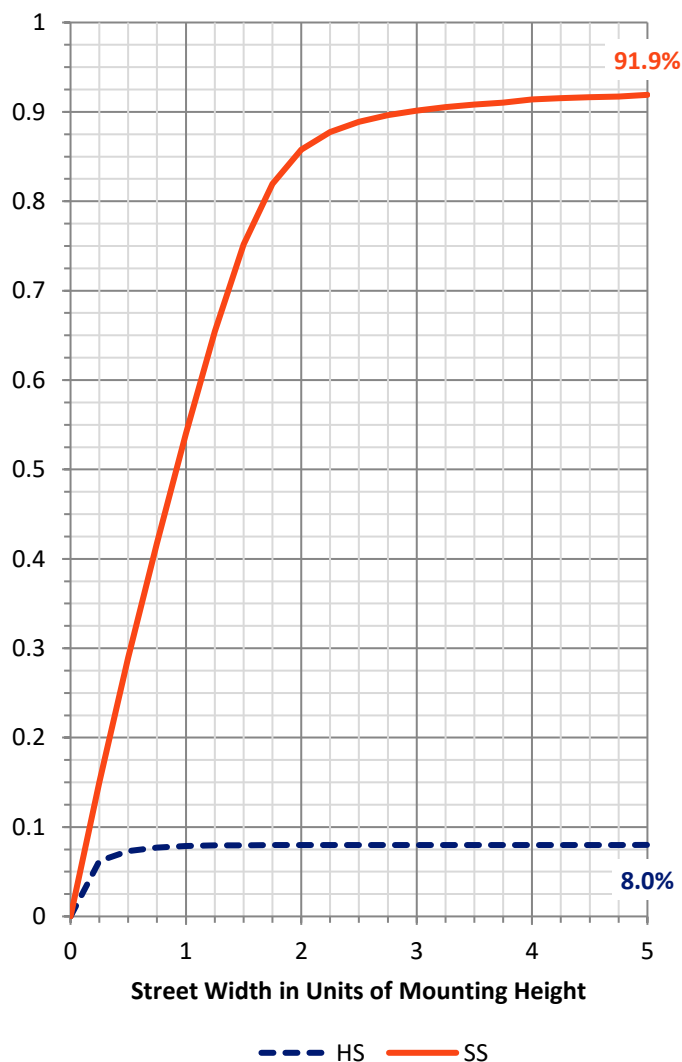
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 379.9 | 0.0 | 379.9 |
| | % Fixture | 8.1 | 0.0 | 8.1 |
| Street Side | Lumens | 4332.1 | 0.0 | 4332.1 |
| | % Fixture | 91.9 | 0.0 | 91.9 |
| Total | Lumens | 4712.0 | 0.0 | 4712.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 106.2 | 2.3 |
| 10°-20° | 223.8 | 4.8 |
| 20°-30° | 302.9 | 6.4 |
| 30°-40° | 416.6 | 8.8 |
| 40°-50° | 652.2 | 13.8 |
| 50°-60° | 1098.7 | 23.3 |
| 60°-70° | 1303.8 | 27.7 |
| 70°-80° | 566.2 | 12.0 |
| 80°-90° | 41.6 | 0.9 |
| 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° | 4712.0 | 100.0 |
| 0°-180° | 4712.0 | 100.0 |

Coefficient of Utilization

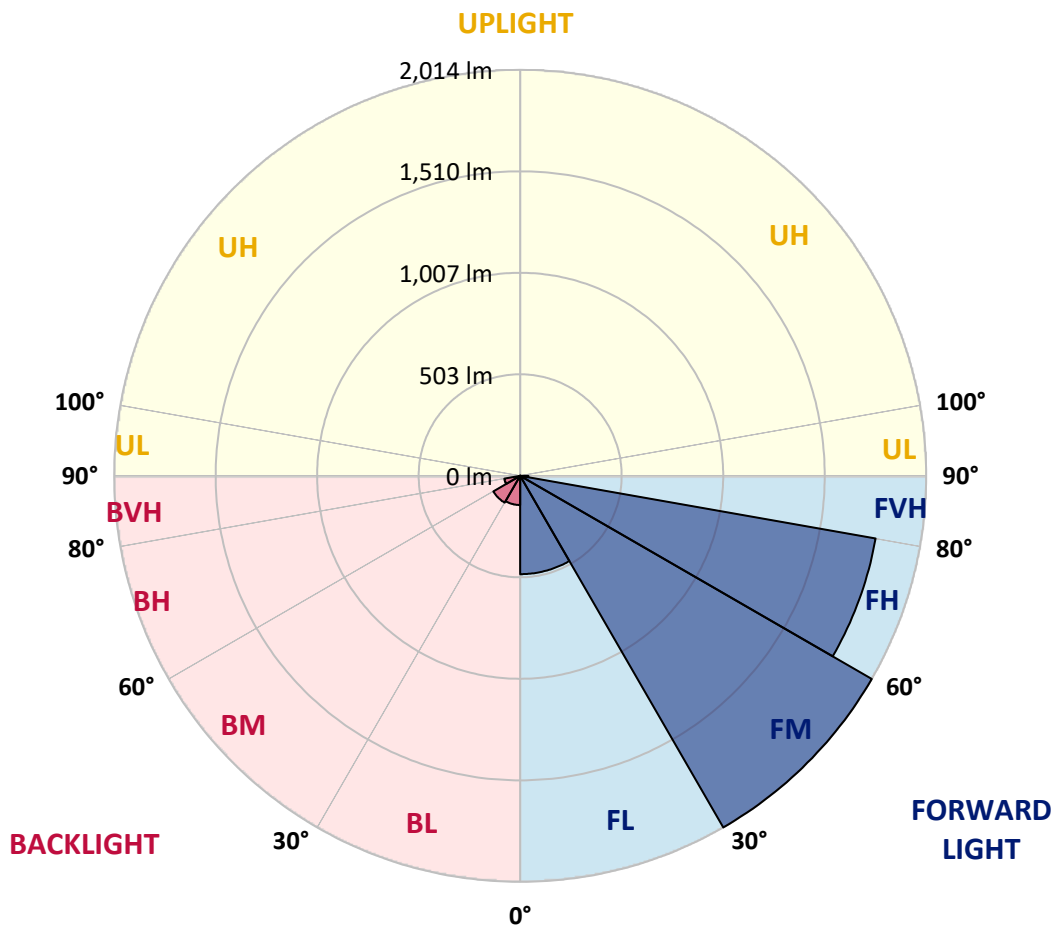


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 487.9 | 10.4 | | | |
| FM (30°-60°) | 2013.7 | 42.7 | | | |
| FH (60°-80°) | 1790.1 | 38.0 | | | G1/1800 |
| FVH (80°-90°) | 40.3 | 0.9 | | | G1/100 |
| BL (0°-30°) | 145.0 | 3.1 | B1/500 | | |
| BM (30°-60°) | 153.7 | 3.3 | B0/220 | | |
| BH (60°-80°) | 80.0 | 1.7 | B0/110 | | G0/110 |
| BVH (80°-90°) | 1.3 | 0.0 | | | G0/10 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B1-U0-G1
 Type III Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 58° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 |
| 2.5° | 1480.8 | 1472.7 | 1468.7 | 1466.6 | 1452.4 | 1440.3 | 1415.9 | 1413.9 | 1397.7 | 1367.2 | 1336.8 |
| 5° | 1448.4 | 1454.5 | 1456.5 | 1462.6 | 1460.5 | 1460.5 | 1444.3 | 1440.3 | 1417.9 | 1375.3 | 1316.5 |
| 7.5° | 1377.4 | 1375.3 | 1379.4 | 1395.6 | 1403.7 | 1420.0 | 1417.9 | 1422.0 | 1411.9 | 1365.2 | 1282.0 |
| 10° | 1273.9 | 1278.0 | 1290.1 | 1304.3 | 1326.7 | 1355.1 | 1373.3 | 1377.4 | 1385.5 | 1346.9 | 1249.6 |
| 12.5° | 1178.6 | 1184.7 | 1192.8 | 1221.2 | 1245.5 | 1290.1 | 1324.6 | 1332.7 | 1349.0 | 1328.7 | 1221.2 |
| 15° | 1099.5 | 1101.5 | 1107.6 | 1133.9 | 1174.5 | 1231.3 | 1282.0 | 1294.2 | 1320.6 | 1312.5 | 1198.9 |
| 17.5° | 1036.6 | 1038.6 | 1046.7 | 1069.0 | 1101.5 | 1168.4 | 1237.4 | 1257.7 | 1296.2 | 1302.3 | 1174.5 |
| 20° | 1002.1 | 1002.1 | 1002.1 | 1016.3 | 1048.8 | 1111.6 | 1192.8 | 1221.2 | 1275.9 | 1286.1 | 1154.2 |
| 22.5° | 992.0 | 992.0 | 987.9 | 992.0 | 1012.2 | 1065.0 | 1148.1 | 1182.6 | 1251.6 | 1280.0 | 1129.9 |
| 25° | 1006.2 | 1000.1 | 1000.1 | 989.9 | 992.0 | 1026.4 | 1107.6 | 1146.1 | 1237.4 | 1275.9 | 1117.7 |
| 27.5° | 1032.5 | 1030.5 | 1022.4 | 1014.3 | 1002.1 | 1010.2 | 1073.1 | 1111.6 | 1223.2 | 1282.0 | 1107.6 |
| 30° | 1063.0 | 1063.0 | 1058.9 | 1054.8 | 1034.6 | 1018.3 | 1056.9 | 1091.3 | 1217.1 | 1292.2 | 1101.5 |
| 32.5° | 1097.4 | 1095.4 | 1105.5 | 1109.6 | 1085.3 | 1054.8 | 1060.9 | 1093.4 | 1221.2 | 1322.6 | 1105.5 |
| 35° | 1138.0 | 1138.0 | 1156.3 | 1180.6 | 1160.3 | 1113.7 | 1099.5 | 1127.9 | 1241.5 | 1355.1 | 1121.8 |
| 37.5° | 1182.6 | 1184.7 | 1217.1 | 1251.6 | 1237.4 | 1196.8 | 1172.5 | 1182.6 | 1284.1 | 1415.9 | 1158.3 |
| 40° | 1235.4 | 1235.4 | 1284.1 | 1340.9 | 1340.9 | 1294.2 | 1261.7 | 1269.9 | 1344.9 | 1503.1 | 1223.2 |
| 42.5° | 1292.2 | 1298.3 | 1367.2 | 1436.2 | 1456.5 | 1413.9 | 1379.4 | 1389.5 | 1442.3 | 1616.7 | 1318.5 |
| 45° | 1373.3 | 1391.6 | 1480.8 | 1547.8 | 1588.3 | 1568.1 | 1523.4 | 1531.5 | 1570.1 | 1781.1 | 1462.6 |
| 47.5° | 1517.3 | 1533.6 | 1610.7 | 1677.6 | 1728.3 | 1738.5 | 1718.2 | 1714.1 | 1730.3 | 1973.8 | 1645.1 |
| 50° | 1689.8 | 1704.0 | 1756.7 | 1813.5 | 1884.5 | 1945.4 | 1933.2 | 1927.1 | 1933.2 | 2184.7 | 1868.3 |
| 52.5° | 1860.2 | 1854.1 | 1917.0 | 1947.4 | 2046.8 | 2180.7 | 2233.4 | 2233.4 | 2201.0 | 2405.8 | 2087.4 |
| 55° | 2012.3 | 2038.7 | 2105.6 | 2160.4 | 2243.6 | 2403.8 | 2582.3 | 2604.6 | 2493.1 | 2624.9 | 2269.9 |
| 57.5° | 1994.0 | 2020.4 | 2144.2 | 2316.6 | 2562.0 | 2779.1 | 2953.5 | 2957.6 | 2795.3 | 2793.3 | 2495.1 |
| 60° | 1781.1 | 1783.1 | 1949.4 | 2211.1 | 2702.0 | 3320.7 | 3422.1 | 3401.8 | 3059.0 | 3028.6 | 2805.5 |
| 62.5° | 1253.6 | 1245.5 | 1460.5 | 1793.2 | 2493.1 | 3616.9 | 4132.1 | 3978.0 | 3497.2 | 3397.8 | 3095.5 |
| 65° | 730.3 | 726.2 | 809.4 | 1071.1 | 1888.6 | 3407.9 | 4858.3 | 4882.7 | 4073.3 | 3586.4 | 3034.7 |
| 67.5° | 490.9 | 495.0 | 533.5 | 661.3 | 1101.5 | 2673.6 | 4992.2 | 5270.1 | 4393.8 | 3489.1 | 2760.8 |
| 70° | 361.1 | 361.1 | 391.5 | 486.8 | 653.2 | 1675.6 | 4361.3 | 4805.6 | 4456.7 | 3245.7 | 2310.5 |
| 72.5° | 257.6 | 257.6 | 300.2 | 393.5 | 533.5 | 864.2 | 3241.6 | 3809.6 | 3762.9 | 2693.9 | 1598.5 |
| 75° | 164.3 | 168.4 | 215.0 | 322.5 | 486.8 | 553.8 | 2198.9 | 2760.8 | 2624.9 | 1507.2 | 681.6 |
| 77.5° | 62.9 | 71.0 | 115.6 | 237.3 | 426.0 | 460.5 | 1253.6 | 1740.5 | 1385.5 | 527.4 | 182.6 |
| 80° | 22.3 | 22.3 | 38.5 | 121.7 | 300.2 | 379.3 | 655.2 | 864.2 | 450.3 | 127.8 | 69.0 |
| 82.5° | 4.1 | 4.1 | 14.2 | 50.7 | 148.1 | 263.7 | 381.4 | 426.0 | 176.5 | 42.6 | 40.6 |
| 85° | 0.0 | 0.0 | 2.0 | 10.1 | 34.5 | 26.4 | 152.1 | 144.0 | 54.8 | 18.3 | 26.4 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 |
| 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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CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 | 1326.7 |
| 2.5° | 1312.5 | 1296.2 | 1249.6 | 1217.1 | 1172.5 | 1127.9 | 1099.5 | 1077.2 | 1067.0 | 1052.8 | 1058.9 |
| 5° | 1280.0 | 1243.5 | 1158.3 | 1081.2 | 1008.2 | 931.1 | 874.3 | 823.6 | 807.4 | 779.0 | 774.9 |
| 7.5° | 1231.3 | 1180.6 | 1054.8 | 933.1 | 815.5 | 718.1 | 630.9 | 563.9 | 503.1 | 476.7 | 492.9 |
| 10° | 1184.7 | 1115.7 | 951.4 | 789.1 | 632.9 | 497.0 | 393.5 | 312.4 | 265.7 | 245.5 | 249.5 |
| 12.5° | 1140.0 | 1052.8 | 843.9 | 651.2 | 460.5 | 306.3 | 223.1 | 180.5 | 166.3 | 164.3 | 160.3 |
| 15° | 1101.5 | 994.0 | 748.5 | 505.1 | 306.3 | 192.7 | 158.2 | 148.1 | 146.1 | 146.1 | 146.1 |
| 17.5° | 1058.9 | 933.1 | 645.1 | 371.2 | 200.8 | 150.1 | 140.0 | 137.9 | 135.9 | 135.9 | 135.9 |
| 20° | 1026.4 | 880.4 | 549.7 | 259.7 | 154.2 | 133.9 | 129.8 | 129.8 | 127.8 | 127.8 | 127.8 |
| 22.5° | 992.0 | 825.6 | 456.4 | 190.7 | 131.9 | 123.7 | 119.7 | 117.7 | 117.7 | 115.6 | 115.6 |
| 25° | 959.5 | 774.9 | 367.2 | 146.1 | 117.7 | 111.6 | 107.5 | 105.5 | 105.5 | 103.5 | 101.4 |
| 27.5° | 939.2 | 734.3 | 288.1 | 123.7 | 105.5 | 101.4 | 97.4 | 93.3 | 89.3 | 87.2 | 87.2 |
| 30° | 925.0 | 685.6 | 219.1 | 107.5 | 97.4 | 91.3 | 85.2 | 79.1 | 73.0 | 71.0 | 71.0 |
| 32.5° | 904.7 | 647.1 | 168.4 | 97.4 | 87.2 | 81.1 | 73.0 | 66.9 | 60.9 | 56.8 | 56.8 |
| 35° | 904.7 | 614.6 | 129.8 | 87.2 | 79.1 | 71.0 | 64.9 | 54.8 | 48.7 | 46.7 | 44.6 |
| 37.5° | 918.9 | 578.1 | 107.5 | 81.1 | 73.0 | 64.9 | 56.8 | 46.7 | 40.6 | 38.5 | 38.5 |
| 40° | 951.4 | 566.0 | 91.3 | 73.0 | 64.9 | 56.8 | 48.7 | 38.5 | 34.5 | 30.4 | 30.4 |
| 42.5° | 1018.3 | 570.0 | 81.1 | 69.0 | 58.8 | 50.7 | 40.6 | 32.5 | 28.4 | 26.4 | 26.4 |
| 45° | 1115.7 | 582.2 | 75.1 | 62.9 | 52.7 | 42.6 | 34.5 | 28.4 | 22.3 | 20.3 | 20.3 |
| 47.5° | 1251.6 | 620.7 | 66.9 | 56.8 | 46.7 | 36.5 | 28.4 | 22.3 | 18.3 | 16.2 | 16.2 |
| 50° | 1413.9 | 687.7 | 62.9 | 50.7 | 42.6 | 30.4 | 22.3 | 16.2 | 12.2 | 12.2 | 12.2 |
| 52.5° | 1604.6 | 754.6 | 56.8 | 46.7 | 36.5 | 26.4 | 18.3 | 12.2 | 10.1 | 8.1 | 8.1 |
| 55° | 1764.8 | 813.4 | 50.7 | 42.6 | 30.4 | 20.3 | 14.2 | 10.1 | 8.1 | 6.1 | 6.1 |
| 57.5° | 1973.8 | 898.6 | 42.6 | 36.5 | 24.3 | 16.2 | 10.1 | 8.1 | 4.1 | 4.1 | 4.1 |
| 60° | 2253.7 | 1000.1 | 36.5 | 30.4 | 18.3 | 12.2 | 8.1 | 4.1 | 4.1 | 2.0 | 2.0 |
| 62.5° | 2373.4 | 918.9 | 32.5 | 24.3 | 14.2 | 8.1 | 6.1 | 4.1 | 2.0 | 2.0 | 2.0 |
| 65° | 2241.5 | 750.6 | 26.4 | 18.3 | 10.1 | 6.1 | 4.1 | 2.0 | 2.0 | 0.0 | 0.0 |
| 67.5° | 1933.2 | 553.8 | 22.3 | 12.2 | 8.1 | 4.1 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 70° | 1576.2 | 409.8 | 16.2 | 8.1 | 4.1 | 4.1 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 72.5° | 1091.3 | 247.5 | 12.2 | 6.1 | 4.1 | 2.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 75° | 424.0 | 97.4 | 10.1 | 6.1 | 4.1 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 77.5° | 119.7 | 34.5 | 8.1 | 4.1 | 4.1 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 0.0 |
| 80° | 48.7 | 18.3 | 6.1 | 4.1 | 4.1 | 4.1 | 2.0 | 2.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 30.4 | 10.1 | 4.1 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 20.3 | 6.1 | 4.1 | 2.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 2.0 |
| 87.5° | 4.1 | 4.1 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-9
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/03/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Invue
 Catalog Number: **EMM2-HTN-SA1A-827-U-5WQ**
 Description: Epic Modern Light Square 40W 5WQ Optic

Spectral Parameters

CCT (K): 2764
 CIE u': 0.2591
 CIE v': 0.5290
 Duv: 0.0020
 CIE x: 0.4581
 CIE y: 0.4156
 CIE z: 0.1263
 Peak Wavelength (nm): 603
 Dominant Wavelength (nm): 583
 Purity: 62.2537
 Rf: 84.7
 Rg: 94.6

| | | | |
|-----------|------|------|------|
| CRI (Ra): | 80.9 | | |
| R1: | 78.8 | R9: | -1.5 |
| R2: | 89.9 | R10: | 77.9 |
| R3: | 96.2 | R11: | 78.9 |
| R4: | 79.1 | R12: | 71.6 |
| R5: | 79.1 | R13: | 81.2 |
| R6: | 88.8 | R14: | 98.5 |
| R7: | 81.3 | R15: | 69.9 |
| R8: | 54.3 | | |



Test Conditions

Stabilization Time: 81M
 Operation Time: 2H 21M
 Sphere Temperature (°C): 25.2

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

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2700K 4-step quadrangle

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Photopic Flux vs. Wavelength



Photopic Lumens: 4337.9

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360 | 0 | 0.0 | 490 | 18018 | 2.6 | 620 | 87426 | 22.8 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 3.9 | 625 | 83013 | 18.2 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 5.8 | 630 | 78077 | 14.1 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 8.5 | 635 | 72080 | 10.7 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 11.5 | 640 | 66249 | 7.9 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 15.2 | 645 | 59973 | 5.7 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 18.7 | 650 | 53972 | 3.9 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 21.9 | 655 | 48369 | 2.7 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 24.9 | 660 | 42641 | 1.8 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 27.6 | 665 | 37602 | 1.1 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.0 | 540 | 46032 | 30.0 | 670 | 32798 | 0.7 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.0 | 545 | 48553 | 32.5 | 675 | 28558 | 0.5 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 0.0 | 550 | 51408 | 34.9 | 680 | 24782 | 0.3 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 0.0 | 555 | 54711 | 37.4 | 685 | 21386 | 0.2 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 0.0 | 560 | 58847 | 40.0 | 690 | 18413 | 0.1 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 0.1 | 565 | 63386 | 42.4 | 695 | 15721 | 0.1 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 0.2 | 570 | 68196 | 44.3 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 0.6 | 575 | 73613 | 46.0 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 0.9 | 580 | 79207 | 47.1 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 0.9 | 585 | 84248 | 47.0 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 0.9 | 590 | 88397 | 45.7 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 1.0 | 595 | 91428 | 43.4 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 0.9 | 600 | 93452 | 40.3 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 1.0 | 605 | 93959 | 36.4 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 1.3 | 610 | 93079 | 32.0 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 1.8 | 615 | 90707 | 27.3 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

REPORT NUMBER: SP1-2407-157-9

Scotopic Flux vs. Wavelength



Scotopic Lumens: 5286.7

S/P: 1.22

| 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 | 0 | 0.0 | 490 | 18018 | 75.9 | 620 | 87426 | 0.4 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 93.2 | 625 | 83013 | 0.2 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 107.8 | 630 | 78077 | 0.1 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 118.7 | 635 | 72080 | 0.1 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 122.2 | 640 | 66249 | 0.1 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 120.8 | 645 | 59973 | 0.0 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 113.9 | 650 | 53972 | 0.0 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 104.1 | 655 | 48369 | 0.0 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 92.4 | 660 | 42641 | 0.0 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 80.5 | 665 | 37602 | 0.0 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.1 | 540 | 46032 | 68.2 | 670 | 32798 | 0.0 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.3 | 545 | 48553 | 57.1 | 675 | 28558 | 0.0 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 1.1 | 550 | 51408 | 46.7 | 680 | 24782 | 0.0 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 2.5 | 555 | 54711 | 37.4 | 685 | 21386 | 0.0 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 5.9 | 560 | 58847 | 29.4 | 690 | 18413 | 0.0 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 12.5 | 565 | 63386 | 22.5 | 695 | 15721 | 0.0 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 26.3 | 570 | 68196 | 16.9 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 55.2 | 575 | 73613 | 12.4 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 85.4 | 580 | 79207 | 9.0 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 75.1 | 585 | 84248 | 6.3 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 63.2 | 590 | 88397 | 4.4 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 63.2 | 595 | 91428 | 3.0 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 54.2 | 600 | 93452 | 2.0 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 48.8 | 605 | 93959 | 1.3 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 54.2 | 610 | 93079 | 0.9 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 63.3 | 615 | 90707 | 0.5 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

REPORT NUMBER: SP1-2407-157-9

Melanopic Flux vs. Wavelength



Melanopic Lumens: 9797

M/P: 2.26

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360 | 0 | 0.0 | 490 | 18018 | 27.7 | 620 | 87426 | 1.1 | 750 | 2680 | 0.0 | 880 | 58 | 0.0 |
| 365 | 0 | 0.0 | 495 | 22295 | 36.0 | 625 | 83013 | 0.7 | 755 | 2287 | 0.0 | 885 | 46 | 0.0 |
| 370 | 0 | 0.0 | 500 | 26478 | 44.2 | 630 | 78077 | 0.4 | 760 | 1944 | 0.0 | 890 | 45 | 0.0 |
| 375 | 0 | 0.0 | 505 | 30524 | 51.8 | 635 | 72080 | 0.3 | 765 | 1653 | 0.0 | 895 | 41 | 0.0 |
| 380 | 0 | 0.0 | 510 | 33611 | 57.0 | 640 | 66249 | 0.2 | 770 | 1413 | 0.0 | 900 | 38 | 0.0 |
| 385 | 0 | 0.0 | 515 | 36490 | 60.5 | 645 | 59973 | 0.1 | 775 | 1198 | 0.0 | 905 | 33 | 0.0 |
| 390 | 0 | 0.0 | 520 | 38610 | 61.4 | 650 | 53972 | 0.1 | 780 | 1025 | 0.0 | 910 | 30 | 0.0 |
| 395 | 0 | 0.0 | 525 | 40511 | 60.6 | 655 | 48369 | 0.0 | 785 | 874 | 0.0 | 915 | 23 | 0.0 |
| 400 | 48 | 0.0 | 530 | 42223 | 58.2 | 660 | 42641 | 0.0 | 790 | 747 | 0.0 | 920 | 24 | 0.0 |
| 405 | 201 | 0.0 | 535 | 44137 | 55.0 | 665 | 37602 | 0.0 | 795 | 639 | 0.0 | 925 | 22 | 0.0 |
| 410 | 457 | 0.0 | 540 | 46032 | 50.9 | 670 | 32798 | 0.0 | 800 | 547 | 0.0 | 930 | 22 | 0.0 |
| 415 | 925 | 0.1 | 545 | 48553 | 46.6 | 675 | 28558 | 0.0 | 805 | 473 | 0.0 | 935 | 17 | 0.0 |
| 420 | 1816 | 0.3 | 550 | 51408 | 42.0 | 680 | 24782 | 0.0 | 810 | 401 | 0.0 | 940 | 13 | 0.0 |
| 425 | 3217 | 0.8 | 555 | 54711 | 37.4 | 685 | 21386 | 0.0 | 815 | 351 | 0.0 | 945 | 6 | 0.0 |
| 430 | 5520 | 1.9 | 560 | 58847 | 32.9 | 690 | 18413 | 0.0 | 820 | 307 | 0.0 | 950 | 10 | 0.0 |
| 435 | 9225 | 4.1 | 565 | 63386 | 28.4 | 695 | 15721 | 0.0 | 825 | 261 | 0.0 | 955 | 11 | 0.0 |
| 440 | 15522 | 8.7 | 570 | 68196 | 24.1 | 700 | 13432 | 0.0 | 830 | 228 | 0.0 | 960 | 8 | 0.0 |
| 445 | 27642 | 18.5 | 575 | 73613 | 20.0 | 705 | 11513 | 0.0 | 835 | 193 | 0.0 | 965 | 12 | 0.0 |
| 450 | 36602 | 28.3 | 580 | 79207 | 16.3 | 710 | 9780 | 0.0 | 840 | 174 | 0.0 | 970 | 3 | 0.0 |
| 455 | 28292 | 24.7 | 585 | 84248 | 12.9 | 715 | 8356 | 0.0 | 845 | 151 | 0.0 | 975 | 8 | 0.0 |
| 460 | 21166 | 20.4 | 590 | 88397 | 9.8 | 720 | 7161 | 0.0 | 850 | 123 | 0.0 | 980 | 2 | 0.0 |
| 465 | 19092 | 20.1 | 595 | 91428 | 7.3 | 725 | 6067 | 0.0 | 855 | 106 | 0.0 | 985 | 13 | 0.0 |
| 470 | 14951 | 17.2 | 600 | 93452 | 5.3 | 730 | 5164 | 0.0 | 860 | 95 | 0.0 | 990 | 16 | 0.0 |
| 475 | 12606 | 15.7 | 605 | 93959 | 3.7 | 735 | 4393 | 0.0 | 865 | 82 | 0.0 | 995 | 20 | 0.0 |
| 480 | 13323 | 18.0 | 610 | 93079 | 2.5 | 740 | 3694 | 0.0 | 870 | 77 | 0.0 | 1000 | 0 | 0.0 |
| 485 | 15164 | 21.9 | 615 | 90707 | 1.7 | 745 | 3157 | 0.0 | 875 | 65 | 0.0 | | | |

Summary

$R_f = 84.7$
 $R_g = 94.6$
 CIE $R_a = 80.9$
 $R_g = -1.5$



Color Vector Graphics

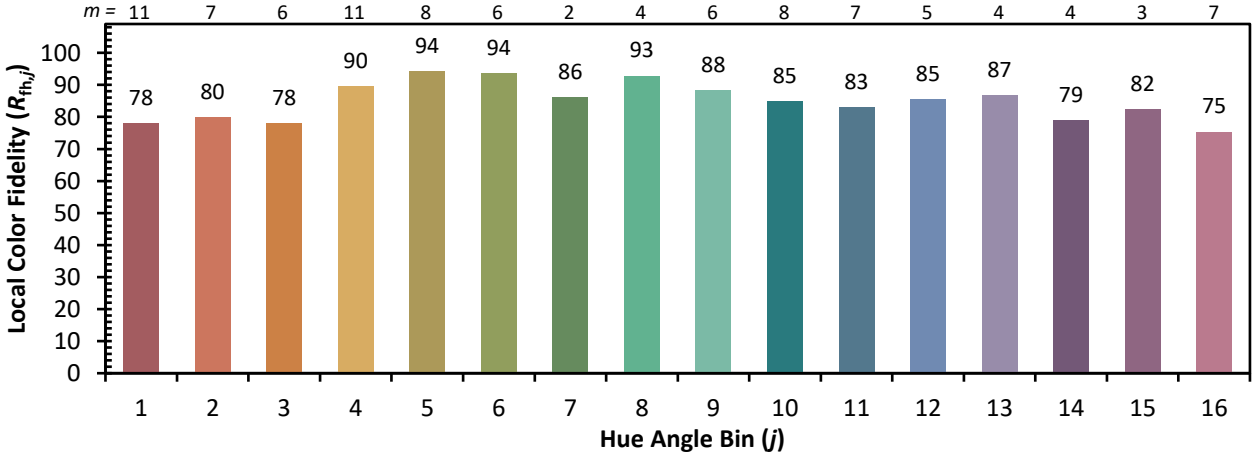


Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 95 | CES76 = 81 |
| CES02 = 63 | CES27 = 95 | CES52 = 94 | CES77 = 84 |
| CES03 = 31 | CES28 = 94 | CES53 = 89 | CES78 = 81 |
| CES04 = 71 | CES29 = 87 | CES54 = 91 | CES79 = 89 |
| CES05 = 50 | CES30 = 94 | CES55 = 90 | CES80 = 89 |
| CES06 = 52 | CES31 = 89 | CES56 = 86 | CES81 = 69 |
| CES07 = 43 | CES32 = 82 | CES57 = 85 | CES82 = 96 |
| CES08 = 41 | CES33 = 91 | CES58 = 86 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 91 | CES84 = 92 |
| CES10 = 77 | CES35 = 96 | CES60 = 94 | CES85 = 76 |
| CES11 = 60 | CES36 = 90 | CES61 = 89 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 94 | CES87 = 84 |
| CES13 = 44 | CES38 = 98 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 82 | CES89 = 73 |
| CES15 = 72 | CES40 = 95 | CES65 = 78 | CES90 = 88 |
| CES16 = 48 | CES41 = 96 | CES66 = 81 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 80 | CES92 = 64 |
| CES18 = 57 | CES43 = 91 | CES68 = 83 | CES93 = 78 |
| CES19 = 73 | CES44 = 99 | CES69 = 88 | CES94 = 59 |
| CES20 = 67 | CES45 = 93 | CES70 = 80 | CES95 = 74 |
| CES21 = 87 | CES46 = 89 | CES71 = 79 | CES96 = 83 |
| CES22 = 79 | CES47 = 92 | CES72 = 92 | CES97 = 88 |
| CES23 = 92 | CES48 = 83 | CES73 = 75 | CES98 = 83 |
| CES24 = 91 | CES49 = 90 | CES74 = 91 | CES99 = 74 |
| CES25 = 72 | CES50 = 94 | CES75 = 81 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)