

Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



Scaled data based on original data using
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: INVUE

Report Number: P870644

Luminaire Tested: **EMM2-HTN-SA2A-840-U-T2R**

Issue Date: 09/05/2024



Test Information

Test Method: LM-79-08
Report Number: P870644
Test Lab: INNOVATION CENTER(G3)
Issue Date: 09/05/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HTN-SA2A-840-U-T2R
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 70W 80CRI 4000K
FIXTURE w/ TYPE II ROADWAY DISTRIBUTION OPTIC
Light Source: (20) 4000K CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

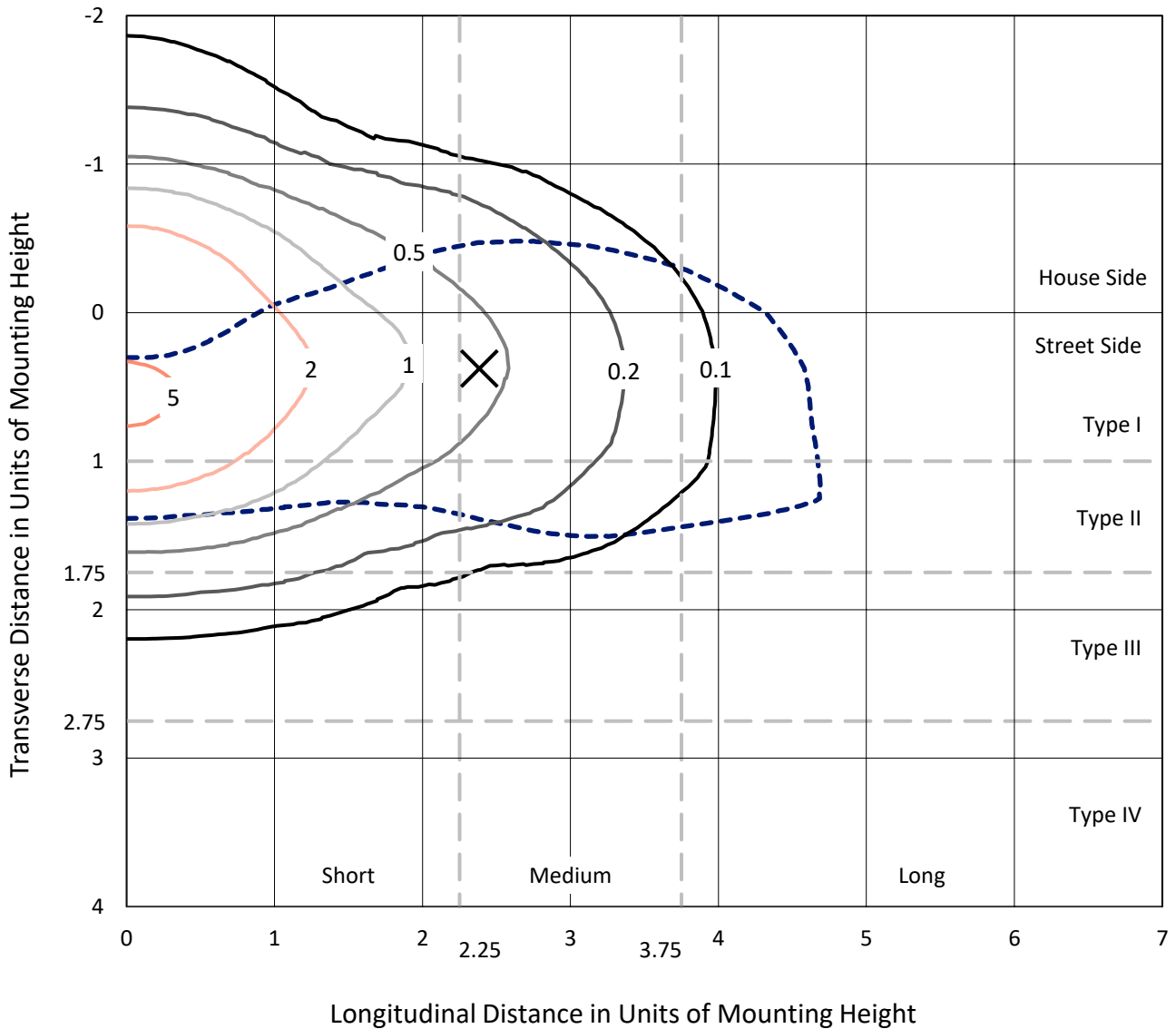
Lumens per Lamp: N/A
Luminaire Lumens: 8917.3 lumens
Efficiency: N/A
Efficacy: 146.2 lumens/watt
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')
IES Classification: Type II - Medium
BUG Rating: B2 - U0 - G2

Input Watts (W): 61
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 9.89%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

REPORT NUMBER: P870644
 CATALOG NUMBER: EMM2-HTN-SA2A-840-U-T2R

Iso-Footcandle Lines of Horizontal Illumination

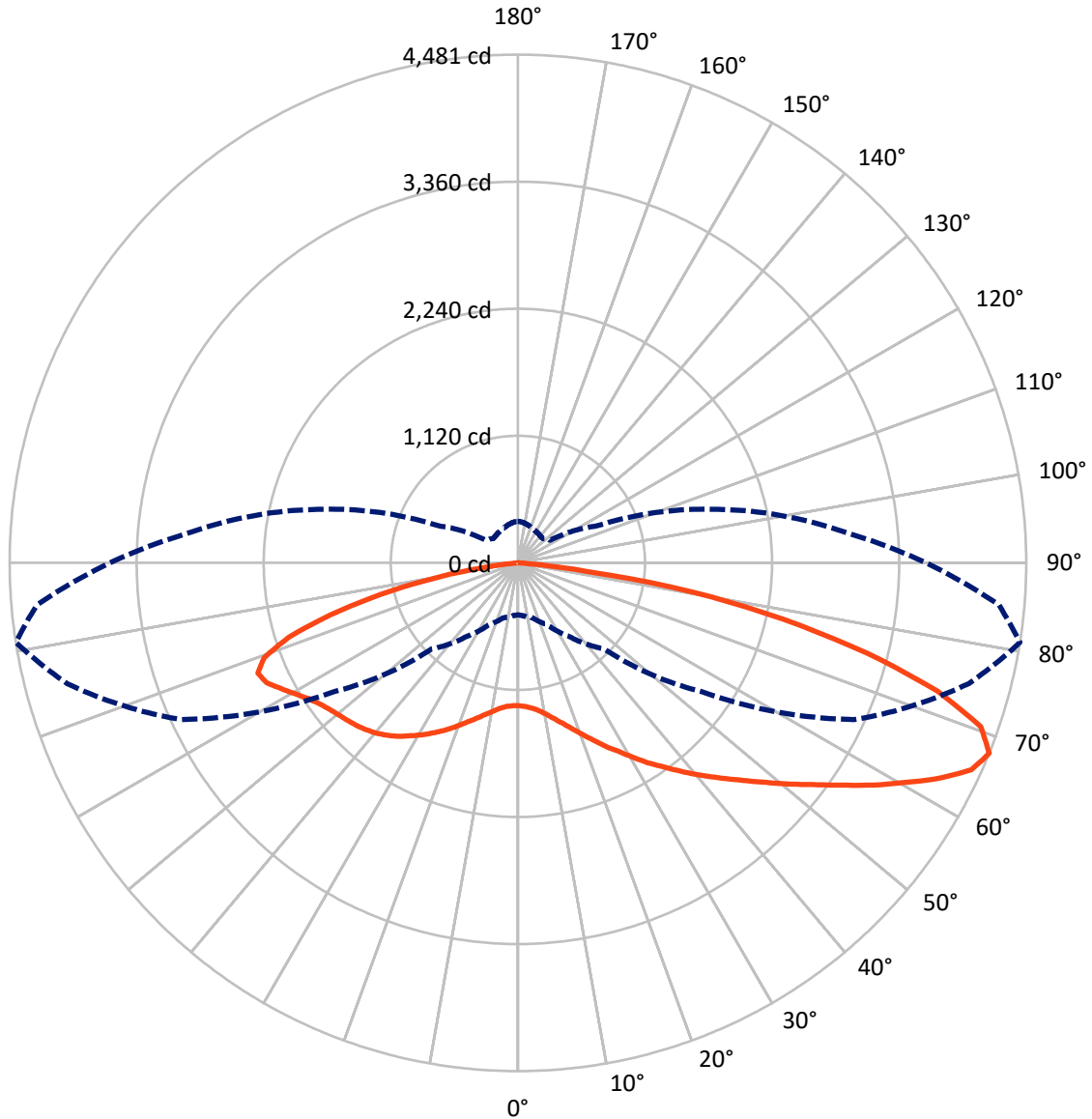
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 5.7 fc
 Type II - Medium - N/A

REPORT NUMBER: P870644
CATALOG NUMBER: EMM2-HTN-SA2A-840-U-T2R

Luminous Intensity Polar Plot



— Vertical Plane Through 81-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

REPORT NUMBER: P870644
 CATALOG NUMBER: EMM2-HTN-SA2A-840-U-T2R

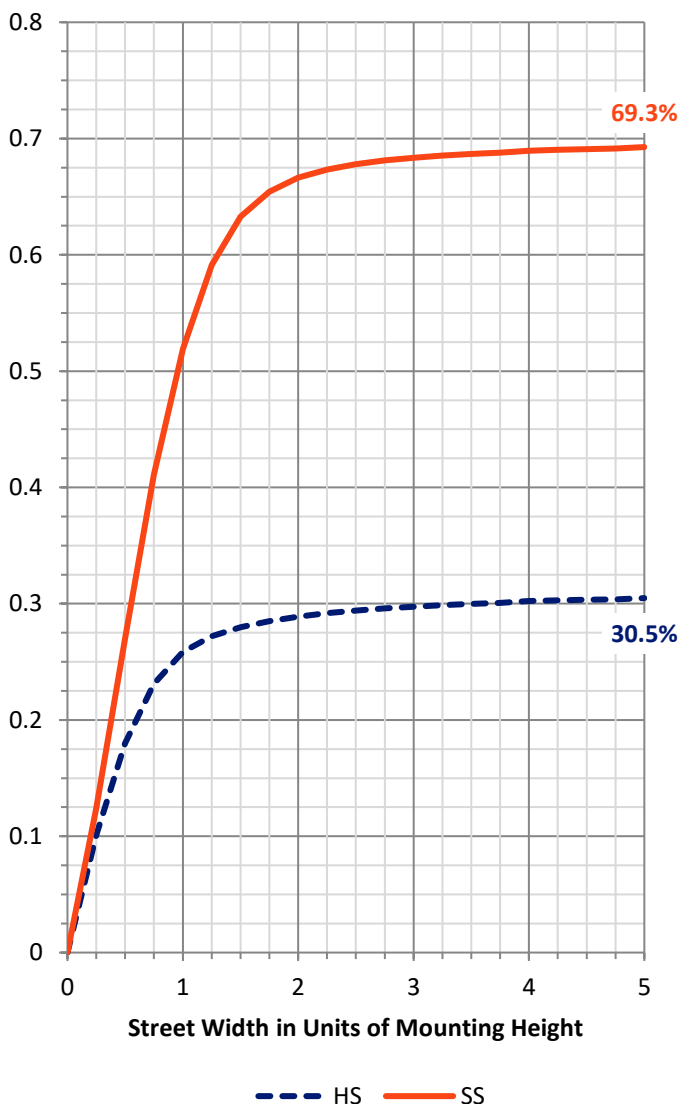
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 2732.5 | 0.0 | 2732.5 |
| | % Fixture | 30.6 | 0.0 | 30.6 |
| Street Side | Lumens | 6184.8 | 0.0 | 6184.8 |
| | % Fixture | 69.4 | 0.0 | 69.4 |
| Total | Lumens | 8917.3 | 0.0 | 8917.3 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 128.4 | 1.4 |
| 10°-20° | 455.7 | 5.1 |
| 20°-30° | 907.7 | 10.2 |
| 30°-40° | 1426.0 | 16.0 |
| 40°-50° | 1768.5 | 19.8 |
| 50°-60° | 1728.8 | 19.4 |
| 60°-70° | 1453.8 | 16.3 |
| 70°-80° | 923.8 | 10.4 |
| 80°-90° | 124.7 | 1.4 |
| 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° | 8917.3 | 100.0 |
| 0°-180° | 8917.3 | 100.0 |

Coefficient of Utilization



REPORT NUMBER: P870644

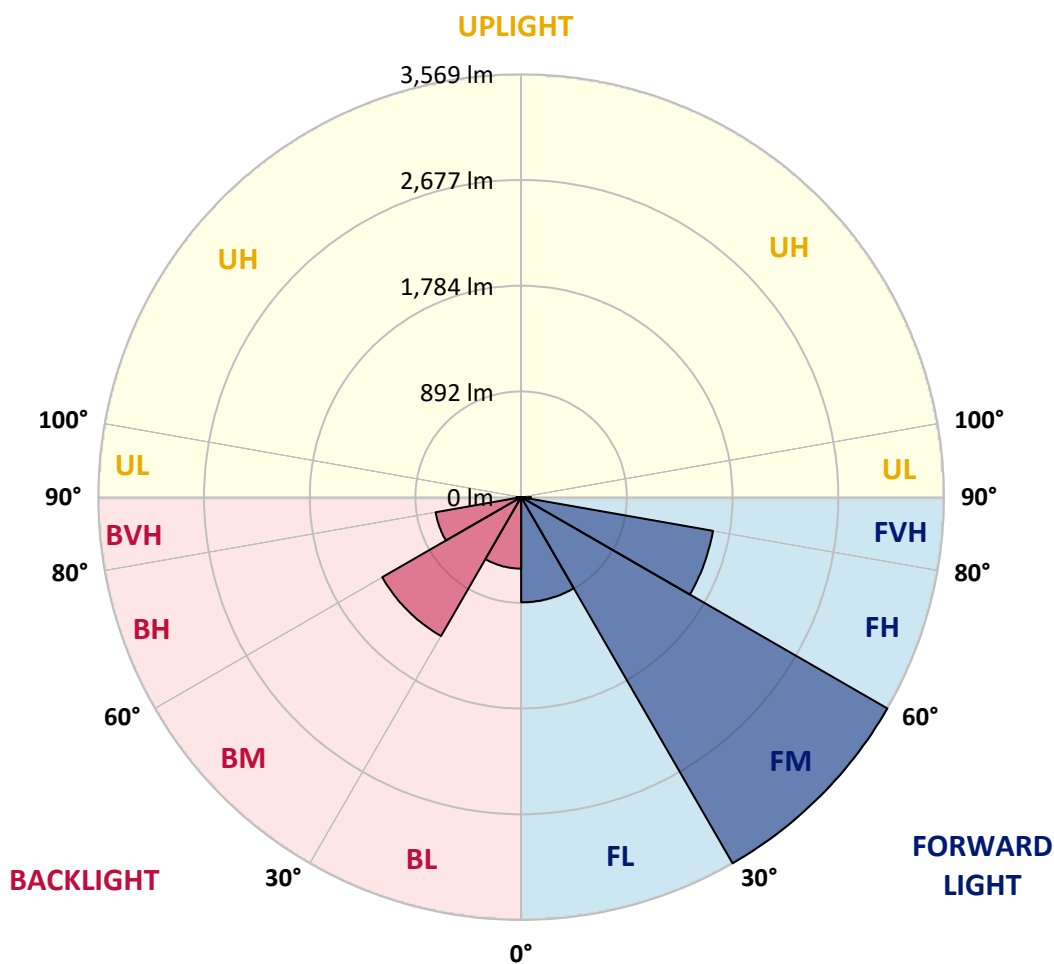
CATALOG NUMBER: EMM2-HTN-SA2A-840-U-T2R

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 888.2 | 10.0 | | | |
| FM (30°-60°) | 3569.0 | 40.0 | | | |
| FH (60°-80°) | 1644.1 | 18.4 | | | G1/1800 |
| FVH (80°-90°) | 83.5 | 0.9 | | | G1/100 |
| BL (0°-30°) | 603.6 | 6.8 | B2/1000 | | |
| BM (30°-60°) | 1354.3 | 15.2 | B2/2500 | | |
| BH (60°-80°) | 733.5 | 8.2 | B2/1000 | | G2/1000 |
| BVH (80°-90°) | 41.1 | 0.5 | | | G1/100 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B2-U0-G2

Type II Medium





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CATALOG NUMBER: EMM2-HTN-SA2A-840-U-T2R

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 81° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 |
| 2.5° | 1303.2 | 1301.4 | 1301.4 | 1287.3 | 1287.3 | 1283.7 | 1285.5 | 1274.9 | 1269.6 | 1267.8 | 1266.0 |
| 5° | 1396.9 | 1396.9 | 1386.3 | 1377.4 | 1359.8 | 1343.8 | 1329.7 | 1308.5 | 1292.6 | 1285.5 | 1280.2 |
| 7.5° | 1538.3 | 1527.7 | 1524.2 | 1497.7 | 1460.5 | 1428.7 | 1400.4 | 1354.4 | 1324.4 | 1313.8 | 1306.7 |
| 10° | 1711.6 | 1697.5 | 1671.0 | 1640.9 | 1593.2 | 1545.4 | 1488.8 | 1426.9 | 1377.4 | 1356.2 | 1347.4 |
| 12.5° | 1890.2 | 1870.8 | 1833.6 | 1805.3 | 1743.5 | 1671.0 | 1591.4 | 1506.5 | 1437.6 | 1407.5 | 1391.6 |
| 15° | 2086.5 | 2075.9 | 2031.7 | 1975.1 | 1902.6 | 1800.0 | 1701.0 | 1596.7 | 1508.3 | 1465.8 | 1439.3 |
| 17.5° | 2298.7 | 2282.8 | 2235.0 | 2166.1 | 2063.5 | 1941.5 | 1826.6 | 1692.2 | 1589.6 | 1534.8 | 1504.7 |
| 20° | 2507.3 | 2503.8 | 2433.1 | 2367.6 | 2247.4 | 2095.3 | 1946.8 | 1805.3 | 1676.3 | 1612.6 | 1573.7 |
| 22.5° | 2740.7 | 2717.7 | 2655.9 | 2563.9 | 2420.7 | 2281.0 | 2105.9 | 1922.0 | 1770.0 | 1695.7 | 1651.5 |
| 25° | 2983.0 | 2981.2 | 2905.2 | 2792.0 | 2624.0 | 2447.2 | 2258.0 | 2054.7 | 1881.4 | 1791.2 | 1732.8 |
| 27.5° | 3283.6 | 3260.6 | 3163.3 | 3034.2 | 2839.7 | 2636.4 | 2417.1 | 2192.6 | 1987.5 | 1879.6 | 1808.9 |
| 30° | 3547.0 | 3540.0 | 3430.3 | 3285.3 | 3067.8 | 2825.6 | 2588.7 | 2348.2 | 2113.0 | 1985.7 | 1907.9 |
| 32.5° | 3761.0 | 3752.1 | 3658.4 | 3513.4 | 3280.0 | 3028.9 | 2756.6 | 2494.9 | 2238.6 | 2100.6 | 1998.1 |
| 35° | 3939.6 | 3925.4 | 3828.2 | 3683.2 | 3481.6 | 3227.0 | 2937.0 | 2648.8 | 2376.5 | 2208.5 | 2111.2 |
| 37.5° | 4010.3 | 3997.9 | 3918.4 | 3798.1 | 3612.5 | 3379.0 | 3099.7 | 2818.5 | 2514.4 | 2330.5 | 2220.9 |
| 40° | 3983.8 | 3976.7 | 3920.1 | 3837.0 | 3695.6 | 3501.1 | 3255.3 | 2995.3 | 2670.0 | 2459.6 | 2328.7 |
| 42.5° | 3858.2 | 3858.2 | 3822.9 | 3780.4 | 3709.7 | 3570.0 | 3393.2 | 3165.1 | 2820.3 | 2588.7 | 2431.3 |
| 45° | 3681.4 | 3674.3 | 3662.0 | 3646.0 | 3635.4 | 3582.4 | 3483.4 | 3311.9 | 2986.5 | 2730.1 | 2555.1 |
| 47.5° | 3446.2 | 3451.5 | 3442.7 | 3449.8 | 3494.0 | 3527.6 | 3522.3 | 3448.0 | 3156.3 | 2885.7 | 2677.1 |
| 50° | 3076.7 | 3101.4 | 3129.7 | 3212.8 | 3303.0 | 3396.7 | 3483.4 | 3545.3 | 3356.1 | 3062.5 | 2818.5 |
| 52.5° | 2618.7 | 2629.3 | 2705.4 | 2901.6 | 3094.4 | 3218.1 | 3382.6 | 3589.5 | 3532.9 | 3246.4 | 2984.7 |
| 55° | 2054.7 | 2074.1 | 2189.0 | 2466.7 | 2809.7 | 3046.6 | 3239.4 | 3570.0 | 3713.2 | 3456.9 | 3179.2 |
| 57.5° | 1472.9 | 1485.3 | 1669.2 | 1955.6 | 2403.0 | 2800.8 | 3076.7 | 3492.2 | 3858.2 | 3695.6 | 3379.0 |
| 60° | 1046.8 | 1069.8 | 1188.2 | 1467.6 | 1897.3 | 2461.3 | 2928.2 | 3379.0 | 3992.6 | 3929.0 | 3640.7 |
| 62.5° | 772.7 | 785.1 | 868.2 | 1071.5 | 1425.2 | 1998.1 | 2735.4 | 3295.9 | 4081.0 | 4180.0 | 3902.4 |
| 65° | 581.7 | 587.0 | 643.6 | 783.3 | 1066.2 | 1472.9 | 2431.3 | 3280.0 | 4130.5 | 4394.0 | 4134.1 |
| 67.5° | 458.0 | 466.8 | 502.2 | 597.7 | 793.9 | 1071.5 | 1980.4 | 3269.4 | 4112.9 | 4480.6 | 4256.1 |
| 70° | 385.5 | 387.2 | 413.8 | 466.8 | 594.1 | 770.9 | 1480.0 | 3110.3 | 4013.8 | 4328.6 | 4142.9 |
| 72.5° | 334.2 | 334.2 | 346.6 | 389.0 | 477.4 | 583.5 | 1007.9 | 2730.1 | 3762.8 | 3867.1 | 3750.4 |
| 75° | 270.5 | 268.8 | 290.0 | 330.7 | 383.7 | 449.1 | 677.2 | 2067.0 | 3235.8 | 3182.8 | 3087.3 |
| 77.5° | 235.2 | 233.4 | 251.1 | 286.5 | 316.5 | 358.9 | 463.3 | 1342.1 | 2546.2 | 2387.1 | 2327.0 |
| 80° | 201.6 | 196.3 | 210.4 | 244.0 | 259.9 | 279.4 | 320.0 | 781.5 | 1663.9 | 1564.9 | 1492.4 |
| 82.5° | 152.1 | 139.7 | 136.2 | 164.4 | 175.1 | 162.7 | 162.7 | 274.1 | 604.7 | 610.0 | 564.1 |
| 85° | 12.4 | 14.1 | 17.7 | 21.2 | 30.1 | 33.6 | 35.4 | 58.4 | 90.2 | 86.6 | 88.4 |
| 87.5° | 1.8 | 1.8 | 1.8 | 3.5 | 3.5 | 5.3 | 5.3 | 5.3 | 7.1 | 7.1 | 7.1 |
| 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: P870644

CATALOG NUMBER: EMM2-HTN-SA2A-840-U-T2R

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 | 1259.0 |
| 2.5° | 1264.3 | 1260.7 | 1257.2 | 1257.2 | 1257.2 | 1253.7 | 1251.9 | 1251.9 | 1250.1 | 1244.8 | 1243.1 |
| 5° | 1276.6 | 1271.3 | 1266.0 | 1266.0 | 1266.0 | 1264.3 | 1262.5 | 1264.3 | 1262.5 | 1257.2 | 1255.4 |
| 7.5° | 1301.4 | 1294.3 | 1287.3 | 1287.3 | 1290.8 | 1289.0 | 1289.0 | 1290.8 | 1289.0 | 1283.7 | 1282.0 |
| 10° | 1336.8 | 1326.2 | 1322.6 | 1322.6 | 1326.2 | 1324.4 | 1322.6 | 1322.6 | 1320.9 | 1312.0 | 1315.5 |
| 12.5° | 1375.7 | 1365.1 | 1361.5 | 1363.3 | 1361.5 | 1358.0 | 1359.8 | 1354.4 | 1352.7 | 1338.5 | 1336.8 |
| 15° | 1425.2 | 1412.8 | 1405.7 | 1407.5 | 1402.2 | 1395.1 | 1388.0 | 1384.5 | 1377.4 | 1365.1 | 1361.5 |
| 17.5° | 1481.8 | 1462.3 | 1453.5 | 1453.5 | 1442.9 | 1428.7 | 1418.1 | 1407.5 | 1396.9 | 1382.7 | 1379.2 |
| 20° | 1536.6 | 1518.9 | 1504.7 | 1501.2 | 1480.0 | 1457.0 | 1437.6 | 1419.9 | 1407.5 | 1391.6 | 1388.0 |
| 22.5° | 1605.5 | 1580.8 | 1561.3 | 1545.4 | 1513.6 | 1476.5 | 1446.4 | 1421.6 | 1404.0 | 1386.3 | 1381.0 |
| 25° | 1678.0 | 1642.7 | 1610.8 | 1580.8 | 1536.6 | 1483.5 | 1441.1 | 1405.7 | 1382.7 | 1363.3 | 1359.8 |
| 27.5° | 1750.5 | 1704.6 | 1658.6 | 1610.8 | 1543.6 | 1474.7 | 1414.6 | 1372.1 | 1342.1 | 1317.3 | 1313.8 |
| 30° | 1828.3 | 1771.7 | 1699.3 | 1630.3 | 1541.9 | 1451.7 | 1375.7 | 1315.5 | 1280.2 | 1251.9 | 1248.4 |
| 32.5° | 1907.9 | 1837.2 | 1738.2 | 1644.4 | 1533.0 | 1418.1 | 1319.1 | 1255.4 | 1211.2 | 1179.4 | 1170.6 |
| 35° | 1996.3 | 1909.7 | 1773.5 | 1649.7 | 1508.3 | 1368.6 | 1259.0 | 1179.4 | 1128.1 | 1096.3 | 1089.2 |
| 37.5° | 2086.5 | 1976.9 | 1796.5 | 1646.2 | 1472.9 | 1310.2 | 1181.2 | 1099.8 | 1039.7 | 995.5 | 988.4 |
| 40° | 2178.4 | 2038.7 | 1810.6 | 1628.5 | 1423.4 | 1237.7 | 1108.7 | 1009.6 | 923.0 | 882.3 | 862.9 |
| 42.5° | 2263.3 | 2095.3 | 1817.7 | 1603.8 | 1368.6 | 1161.7 | 1013.2 | 884.1 | 802.8 | 758.6 | 767.4 |
| 45° | 2351.7 | 2148.4 | 1819.5 | 1573.7 | 1296.1 | 1064.5 | 892.9 | 772.7 | 691.4 | 657.8 | 654.2 |
| 47.5° | 2427.8 | 2192.6 | 1816.0 | 1531.3 | 1214.8 | 953.1 | 767.4 | 652.5 | 592.4 | 560.5 | 557.0 |
| 50° | 2528.5 | 2242.1 | 1810.6 | 1481.8 | 1108.7 | 825.8 | 650.7 | 557.0 | 502.2 | 477.4 | 475.6 |
| 52.5° | 2629.3 | 2296.9 | 1807.1 | 1412.8 | 997.3 | 705.5 | 544.6 | 470.3 | 433.2 | 420.8 | 417.3 |
| 55° | 2761.9 | 2364.1 | 1808.9 | 1333.2 | 870.0 | 581.7 | 461.5 | 410.2 | 390.8 | 385.5 | 385.5 |
| 57.5° | 2914.0 | 2450.7 | 1819.5 | 1244.8 | 737.3 | 481.0 | 401.4 | 378.4 | 376.6 | 380.2 | 381.9 |
| 60° | 3097.9 | 2565.7 | 1840.7 | 1152.9 | 615.3 | 406.7 | 366.0 | 364.3 | 369.6 | 381.9 | 385.5 |
| 62.5° | 3304.8 | 2691.2 | 1867.2 | 1032.6 | 498.6 | 357.2 | 346.6 | 353.6 | 360.7 | 374.9 | 376.6 |
| 65° | 3486.9 | 2832.7 | 1883.1 | 917.7 | 417.3 | 328.9 | 334.2 | 337.7 | 355.4 | 374.9 | 374.9 |
| 67.5° | 3596.5 | 2935.2 | 1823.0 | 772.7 | 348.3 | 304.1 | 314.7 | 325.4 | 344.8 | 362.5 | 366.0 |
| 70° | 3559.4 | 2901.6 | 1617.9 | 599.4 | 295.3 | 281.1 | 293.5 | 309.4 | 328.9 | 350.1 | 360.7 |
| 72.5° | 3301.2 | 2662.9 | 1313.8 | 436.7 | 256.4 | 259.9 | 275.8 | 297.1 | 314.7 | 337.7 | 351.9 |
| 75° | 2760.2 | 2222.6 | 947.8 | 314.7 | 224.6 | 238.7 | 263.5 | 281.1 | 293.5 | 298.8 | 300.6 |
| 77.5° | 2095.3 | 1633.8 | 645.4 | 235.2 | 194.5 | 214.0 | 240.5 | 259.9 | 263.5 | 267.0 | 270.5 |
| 80° | 1368.6 | 1039.7 | 364.3 | 164.4 | 148.5 | 175.1 | 196.3 | 217.5 | 210.4 | 221.0 | 224.6 |
| 82.5° | 578.2 | 454.4 | 166.2 | 81.3 | 69.0 | 74.3 | 79.6 | 70.7 | 65.4 | 65.4 | 56.6 |
| 85° | 76.0 | 58.4 | 24.8 | 10.6 | 8.8 | 5.3 | 5.3 | 5.3 | 3.5 | 3.5 | 3.5 |
| 87.5° | 7.1 | 7.1 | 5.3 | 5.3 | 3.5 | 3.5 | 1.8 | 3.5 | 1.8 | 1.8 | 1.8 |
| 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



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-8

Test Date: 09/05/2024

Luminaire Tested: MEM2-HTN-SA-40-840-U-5WQ

Data in this report applies to families of products including MEM2-HTN-SA-40-840-U-5WQ

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-8
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 09/05/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-SA-40-840-U-5WQ**
 Description: Epic Modern Light Square 40W 5WQ Optic

Spectral Parameters

CCT (K): 3996
 CIE u': 0.2245
 CIE v': 0.5031
 Duv: 0.0012
 CIE x: 0.3815
 CIE y: 0.3799
 CIE z: 0.2386
 Peak Wavelength (nm): 449
 Dominant Wavelength (nm): 578
 Purity: 28.49233
 Rf: 82.6
 Rg: 95.1

| | | | |
|-----------|------|------|------|
| CRI (Ra): | 80.6 | | |
| R1: | 78.1 | R9: | -5.8 |
| R2: | 87.1 | R10: | 70.3 |
| R3: | 94.5 | R11: | 78.7 |
| R4: | 79.7 | R12: | 60.5 |
| R5: | 78.7 | R13: | 80.2 |
| R6: | 82.7 | R14: | 97.2 |
| R7: | 84.3 | R15: | 70.6 |
| R8: | 59.5 | | |



Test Conditions

Stabilization Time: 29M
 Operation Time: 1H 29M
 Sphere Temperature (°C): 24.3

REPORT NUMBER: SP1-2407-157-8

| 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 |

REPORT NUMBER: SP1-2407-157-8

CIE 1931 Chromaticity Diagram



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



CCT = 3996K
 CIE x = 0.3815
 CIE y = 0.3799
 Duv = 0.0012

Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2407-157-8

Photopic Flux vs. Wavelength



Photopic Lumens: NR

| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2407-157-8

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.66

| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2407-157-8

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.37

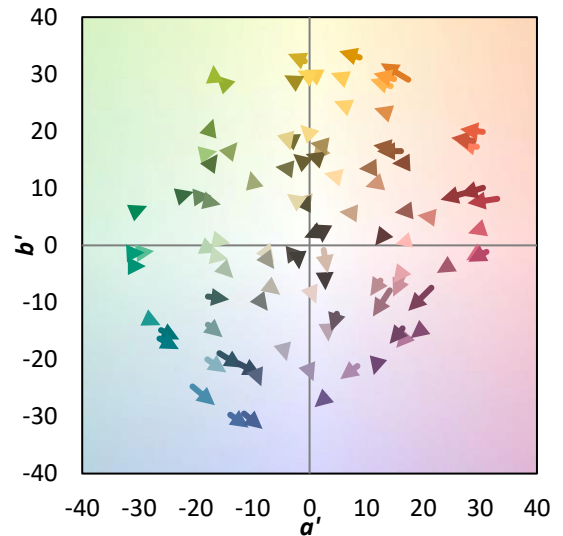
| λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) | λ (nm) | Power W [^] /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360 | 0 | NR | 490 | 289 | NR | 620 | 725 | NR | 750 | 17 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 351 | NR | 625 | 673 | NR | 755 | 15 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 414 | NR | 630 | 619 | NR | 760 | 13 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 470 | NR | 635 | 562 | NR | 765 | 11 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 513 | NR | 640 | 506 | NR | 770 | 9 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 546 | NR | 645 | 452 | NR | 775 | 8 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 571 | NR | 650 | 400 | NR | 780 | 7 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 592 | NR | 655 | 352 | NR | 785 | 6 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 606 | NR | 660 | 307 | NR | 790 | 5 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 624 | NR | 665 | 267 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 642 | NR | 670 | 231 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 22 | NR | 545 | 663 | NR | 675 | 199 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 686 | NR | 680 | 171 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 83 | NR | 555 | 713 | NR | 685 | 146 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 150 | NR | 560 | 745 | NR | 690 | 125 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 267 | NR | 565 | 774 | NR | 695 | 106 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 466 | NR | 570 | 806 | NR | 700 | 90 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 804 | NR | 575 | 835 | NR | 705 | 76 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 858 | NR | 710 | 65 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 715 | NR | 585 | 875 | NR | 715 | 55 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 492 | NR | 590 | 884 | NR | 720 | 47 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 402 | NR | 595 | 880 | NR | 725 | 40 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 288 | NR | 600 | 868 | NR | 730 | 34 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 226 | NR | 605 | 844 | NR | 735 | 28 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 227 | NR | 610 | 814 | NR | 740 | 24 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 248 | NR | 615 | 771 | NR | 745 | 20 | NR | 875 | 0 | NR | | | |

Summary

$R_f = 82.6$
 $R_g = 95.1$
 CIE $R_a = 80.6$
 $R_9 = -5.8$



Color Vector Graphics



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

| | | | |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 79 | CES51 = 94 | CES76 = 72 |
| CES02 = 61 | CES27 = 93 | CES52 = 94 | CES77 = 82 |
| CES03 = 31 | CES28 = 90 | CES53 = 88 | CES78 = 71 |
| CES04 = 69 | CES29 = 83 | CES54 = 89 | CES79 = 91 |
| CES05 = 48 | CES30 = 95 | CES55 = 88 | CES80 = 88 |
| CES06 = 50 | CES31 = 86 | CES56 = 84 | CES81 = 80 |
| CES07 = 40 | CES32 = 78 | CES57 = 84 | CES82 = 95 |
| CES08 = 39 | CES33 = 90 | CES58 = 84 | CES83 = 95 |
| CES09 = 29 | CES34 = 85 | CES59 = 90 | CES84 = 90 |
| CES10 = 74 | CES35 = 92 | CES60 = 91 | CES85 = 78 |
| CES11 = 57 | CES36 = 85 | CES61 = 87 | CES86 = 73 |
| CES12 = 63 | CES37 = 91 | CES62 = 87 | CES87 = 83 |
| CES13 = 42 | CES38 = 95 | CES63 = 84 | CES88 = 86 |
| CES14 = 74 | CES39 = 98 | CES64 = 78 | CES89 = 76 |
| CES15 = 71 | CES40 = 94 | CES65 = 75 | CES90 = 87 |
| CES16 = 46 | CES41 = 98 | CES66 = 75 | CES91 = 72 |
| CES17 = 49 | CES42 = 92 | CES67 = 73 | CES92 = 62 |
| CES18 = 56 | CES43 = 88 | CES68 = 77 | CES93 = 78 |
| CES19 = 71 | CES44 = 99 | CES69 = 82 | CES94 = 60 |
| CES20 = 65 | CES45 = 93 | CES70 = 72 | CES95 = 70 |
| CES21 = 86 | CES46 = 90 | CES71 = 67 | CES96 = 82 |
| CES22 = 78 | CES47 = 95 | CES72 = 89 | CES97 = 90 |
| CES23 = 91 | CES48 = 84 | CES73 = 65 | CES98 = 84 |
| CES24 = 90 | CES49 = 89 | CES74 = 93 | CES99 = 73 |
| CES25 = 71 | CES50 = 94 | CES75 = 69 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)