

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: P869054

Luminaire Tested: **EMM2-HSN-SA1A-730-U-T4W-HSS**

Issue Date: 08/22/2024



Test Information

Test Method: LM-79-08
Report Number: P869054
Test Lab: INNOVATION CENTER(G3)
Issue Date: 08/22/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-SA1A-730-U-T4W-HSS
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 40W 70CRI 3000K
FIXTURE w/ TYPE IV WIDE DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD
Light Source: (10) 3000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

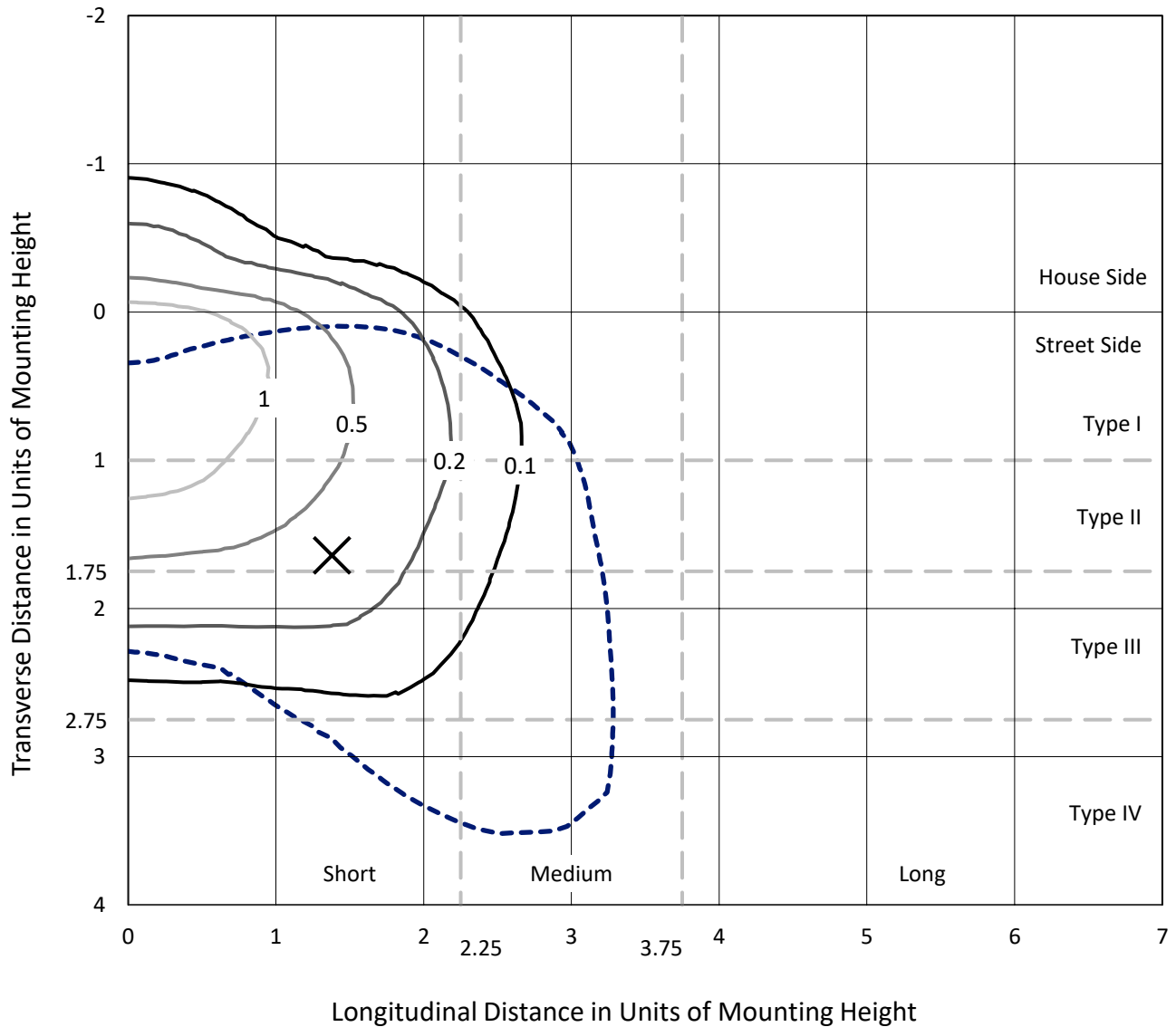
Lumens per Lamp: N/A
Luminaire Lumens: 3306.1 lumens
Efficiency: N/A
Efficacy: 100.8 lumens/watt
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
IES Classification: Type IV - Short
BUG Rating: B1 - U0 - G1

Input Watts (W): 32.8
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 9.76%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

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Iso-Footcandle Lines of Horizontal Illumination

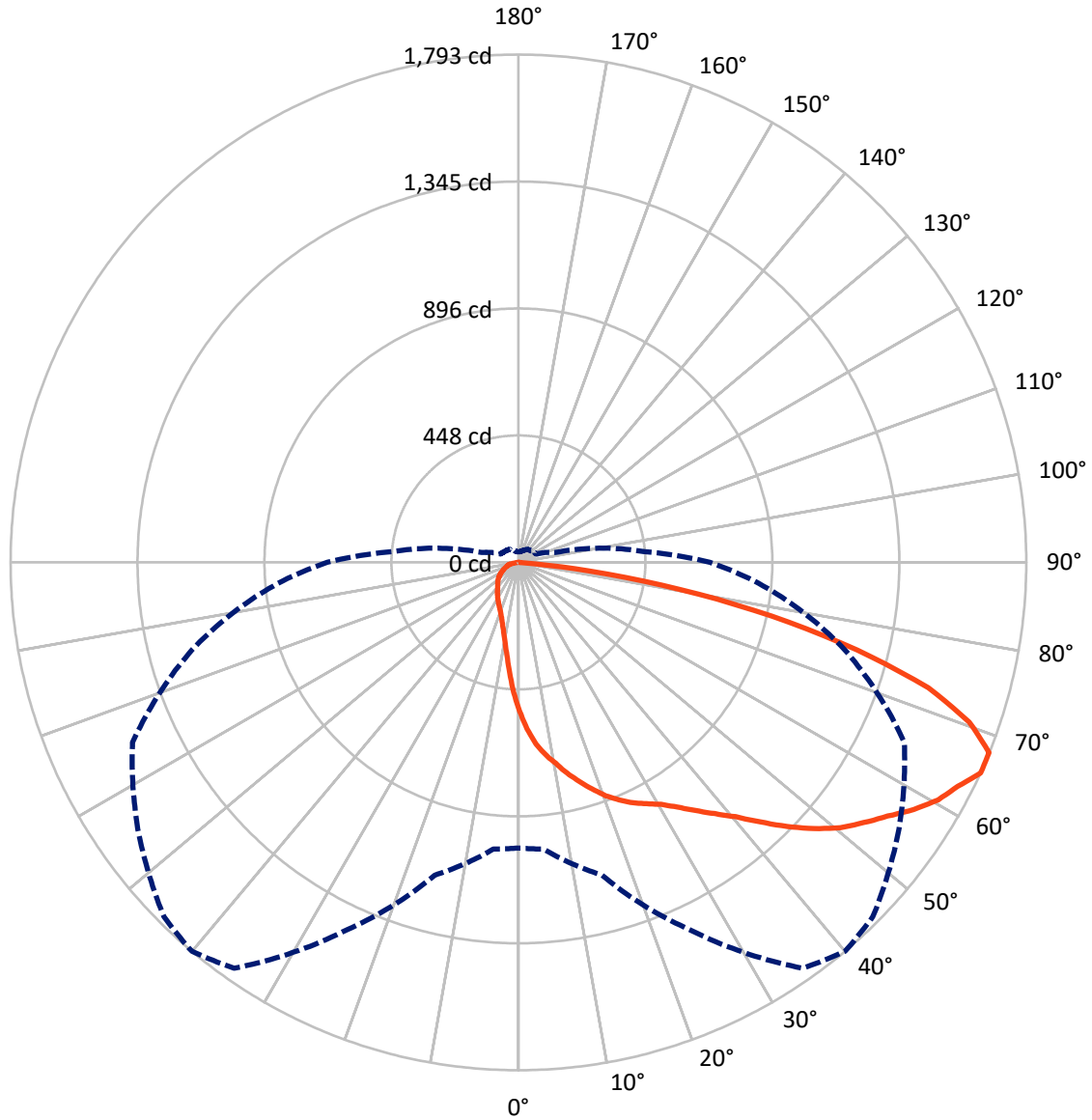
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 1.9 fc
 Type IV - Short - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 40-Deg Lateral - - - Horizontal Cone Through 65-Deg Vertical

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FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 395.8 | 0.0 | 395.8 |
| | % Fixture | 12.0 | 0.0 | 12.0 |
| Street Side | Lumens | 2910.3 | 0.0 | 2910.3 |
| | % Fixture | 88.0 | 0.0 | 88.0 |
| Total | Lumens | 3306.1 | 0.0 | 3306.1 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

Coefficient of Utilization

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 49.2 | 1.5 |
| 10°-20° | 147.9 | 4.5 |
| 20°-30° | 254.5 | 7.7 |
| 30°-40° | 384.6 | 11.6 |
| 40°-50° | 562.4 | 17.0 |
| 50°-60° | 718.4 | 21.7 |
| 60°-70° | 716.9 | 21.7 |
| 70°-80° | 420.4 | 12.7 |
| 80°-90° | 51.8 | 1.6 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 3306.1 | 100.0 |
| 0°-180° | 3306.1 | 100.0 |



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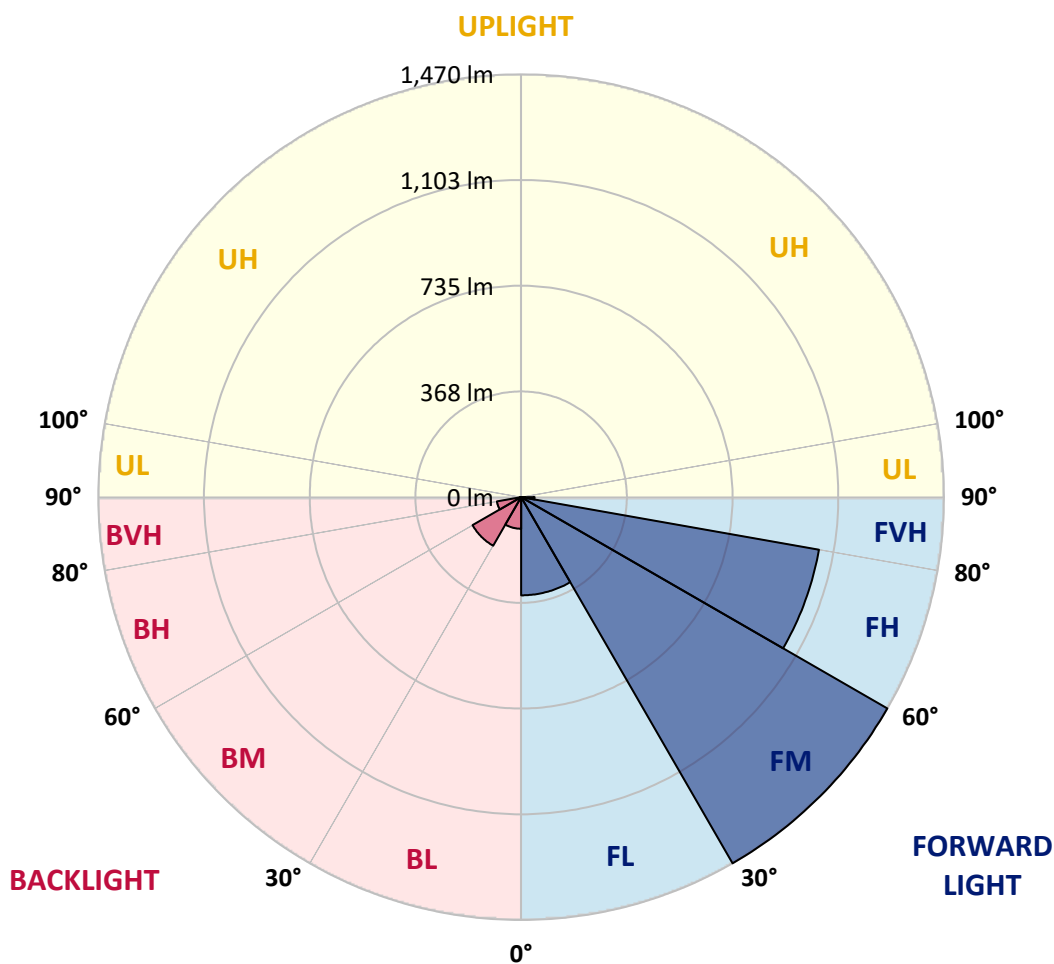
CATALOG NUMBER: EMM2-HSN-SA1A-730-U-T4W-HSS

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|------|-------------|--------|-----------|-------------------------|------|---------|
| | | | | B | U | G |
| FL | (0°-30°) | 341.5 | 10.3 | | | |
| FM | (30°-60°) | 1470.4 | 44.5 | | | |
| FH | (60°-80°) | 1051.6 | 31.8 | | | G1/1800 |
| FVH | (80°-90°) | 46.8 | 1.4 | | | G1/100 |
| BL | (0°-30°) | 110.1 | 3.3 | B1/500 | | |
| BM | (30°-60°) | 195.0 | 5.9 | B0/220 | | |
| BH | (60°-80°) | 85.7 | 2.6 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 5.0 | 0.2 | | | 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 IV Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 40° | 45° | 55° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 0° | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 |
| 2.5° | 613.1 | 610.3 | 604.7 | 600.1 | 593.6 | 588.0 | 582.4 | 572.1 | 559.1 | 547.9 | 533.9 |
| 5° | 673.7 | 669.0 | 665.3 | 659.7 | 648.5 | 643.9 | 640.1 | 618.7 | 596.4 | 573.1 | 542.3 |
| 7.5° | 716.6 | 720.3 | 712.8 | 704.4 | 690.5 | 684.9 | 679.3 | 657.9 | 629.9 | 596.4 | 552.6 |
| 10° | 765.9 | 766.9 | 757.6 | 747.3 | 732.4 | 721.2 | 713.8 | 687.7 | 656.9 | 619.6 | 563.7 |
| 12.5° | 813.5 | 813.5 | 807.9 | 793.0 | 773.4 | 763.1 | 750.1 | 720.3 | 683.0 | 639.2 | 576.8 |
| 15° | 851.7 | 853.5 | 848.9 | 837.7 | 816.3 | 802.3 | 789.2 | 754.8 | 707.2 | 661.6 | 587.0 |
| 17.5° | 886.1 | 885.2 | 882.4 | 872.2 | 851.7 | 840.5 | 827.4 | 789.2 | 735.2 | 679.3 | 602.9 |
| 20° | 909.4 | 909.4 | 908.5 | 902.9 | 888.0 | 879.6 | 863.8 | 823.7 | 765.9 | 705.4 | 619.6 |
| 22.5° | 927.1 | 926.2 | 926.2 | 927.1 | 918.8 | 910.4 | 903.8 | 863.8 | 797.6 | 727.7 | 636.4 |
| 25° | 942.1 | 941.1 | 943.9 | 945.8 | 942.1 | 940.2 | 932.7 | 902.0 | 836.8 | 753.8 | 653.2 |
| 27.5° | 961.6 | 964.4 | 963.5 | 963.5 | 962.6 | 964.4 | 963.5 | 937.4 | 875.0 | 781.8 | 670.9 |
| 30° | 992.4 | 997.0 | 994.2 | 990.5 | 990.5 | 991.4 | 996.1 | 979.3 | 919.7 | 816.3 | 690.5 |
| 32.5° | 1064.1 | 1059.5 | 1039.9 | 1026.8 | 1028.7 | 1029.6 | 1034.3 | 1025.0 | 964.4 | 855.4 | 711.0 |
| 35° | 1146.1 | 1140.5 | 1119.1 | 1089.3 | 1079.0 | 1075.3 | 1074.4 | 1068.8 | 1012.9 | 897.3 | 735.2 |
| 37.5° | 1252.3 | 1254.2 | 1222.5 | 1179.7 | 1148.9 | 1125.6 | 1121.0 | 1108.8 | 1054.8 | 935.5 | 760.3 |
| 40° | 1360.4 | 1353.0 | 1326.0 | 1284.0 | 1223.5 | 1180.6 | 1166.6 | 1149.8 | 1102.3 | 975.6 | 784.6 |
| 42.5° | 1464.8 | 1450.8 | 1415.4 | 1369.7 | 1298.9 | 1252.3 | 1220.7 | 1199.2 | 1146.1 | 1019.4 | 807.9 |
| 45° | 1600.8 | 1560.8 | 1497.4 | 1456.4 | 1367.9 | 1329.7 | 1300.8 | 1253.3 | 1198.3 | 1063.2 | 835.8 |
| 47.5° | 1708.0 | 1630.7 | 1572.9 | 1555.2 | 1439.6 | 1404.2 | 1378.1 | 1312.0 | 1251.4 | 1112.6 | 864.7 |
| 50° | 1688.4 | 1640.9 | 1626.9 | 1611.1 | 1493.7 | 1472.2 | 1448.0 | 1379.1 | 1305.5 | 1164.8 | 892.7 |
| 52.5° | 1638.1 | 1643.7 | 1661.4 | 1634.4 | 1541.2 | 1526.3 | 1510.4 | 1450.8 | 1359.5 | 1207.6 | 917.8 |
| 55° | 1598.0 | 1609.2 | 1656.7 | 1648.4 | 1598.0 | 1581.3 | 1570.1 | 1521.6 | 1411.7 | 1246.7 | 939.3 |
| 57.5° | 1525.4 | 1516.0 | 1575.7 | 1672.6 | 1658.6 | 1645.6 | 1634.4 | 1596.2 | 1464.8 | 1274.7 | 953.2 |
| 60° | 1410.7 | 1376.3 | 1456.4 | 1642.8 | 1700.5 | 1702.4 | 1695.9 | 1652.1 | 1507.7 | 1274.7 | 945.8 |
| 62.5° | 1249.5 | 1216.9 | 1315.7 | 1543.1 | 1722.9 | 1740.6 | 1736.9 | 1671.7 | 1526.3 | 1246.7 | 916.9 |
| 65° | 1008.2 | 1015.7 | 1143.3 | 1430.3 | 1749.0 | 1792.8 | 1769.5 | 1640.0 | 1503.0 | 1192.7 | 851.7 |
| 67.5° | 805.1 | 827.4 | 942.1 | 1284.0 | 1736.9 | 1791.9 | 1759.2 | 1550.5 | 1403.3 | 1117.2 | 752.0 |
| 70° | 635.5 | 650.4 | 745.4 | 1086.5 | 1630.7 | 1688.4 | 1647.4 | 1413.5 | 1234.6 | 1000.8 | 625.2 |
| 72.5° | 496.6 | 510.6 | 591.7 | 869.4 | 1446.2 | 1513.2 | 1462.0 | 1229.0 | 1024.0 | 848.9 | 496.6 |
| 75° | 377.4 | 387.6 | 448.2 | 670.0 | 1151.7 | 1235.6 | 1198.3 | 984.0 | 799.5 | 671.8 | 380.2 |
| 77.5° | 243.2 | 257.2 | 325.2 | 469.6 | 813.5 | 914.1 | 918.8 | 735.2 | 574.9 | 485.5 | 279.5 |
| 80° | 161.2 | 166.8 | 208.7 | 305.6 | 500.4 | 578.6 | 605.7 | 496.6 | 367.1 | 309.4 | 201.3 |
| 82.5° | 67.1 | 74.5 | 99.7 | 153.7 | 250.7 | 251.6 | 287.9 | 209.7 | 149.1 | 131.4 | 84.8 |
| 85° | 1.9 | 3.7 | 2.8 | 7.5 | 6.5 | 10.2 | 12.1 | 16.8 | 12.1 | 13.0 | 13.0 |
| 87.5° | 0.0 | 0.0 | 0.9 | 0.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.8 | 1.9 |
| 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: EMM2-HSN-SA1A-730-U-T4W-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 | 525.5 |
| 2.5° | 527.4 | 519.0 | 502.2 | 489.2 | 475.2 | 465.0 | 455.7 | 445.4 | 438.9 | 439.8 | 433.3 |
| 5° | 527.4 | 511.6 | 478.0 | 448.2 | 421.2 | 401.6 | 380.2 | 363.4 | 351.3 | 349.4 | 355.0 |
| 7.5° | 530.2 | 504.1 | 453.8 | 409.1 | 371.8 | 341.0 | 318.7 | 301.9 | 293.5 | 287.9 | 287.0 |
| 10° | 533.0 | 498.5 | 431.4 | 374.6 | 328.0 | 294.4 | 274.9 | 256.2 | 246.9 | 246.0 | 243.2 |
| 12.5° | 534.9 | 492.0 | 410.9 | 340.1 | 291.7 | 260.0 | 240.4 | 225.5 | 218.0 | 218.0 | 217.1 |
| 15° | 541.4 | 490.1 | 389.5 | 314.0 | 263.7 | 233.0 | 216.2 | 204.1 | 199.4 | 196.6 | 195.7 |
| 17.5° | 547.0 | 486.4 | 370.9 | 287.9 | 238.5 | 211.5 | 195.7 | 187.3 | 182.6 | 180.8 | 179.8 |
| 20° | 555.4 | 484.5 | 353.2 | 266.5 | 219.9 | 193.8 | 181.7 | 174.2 | 171.5 | 169.6 | 169.6 |
| 22.5° | 563.7 | 482.7 | 335.4 | 247.9 | 204.1 | 180.8 | 169.6 | 163.1 | 160.3 | 159.3 | 158.4 |
| 25° | 574.0 | 481.7 | 320.5 | 232.0 | 190.1 | 170.5 | 160.3 | 154.7 | 151.0 | 149.1 | 149.1 |
| 27.5° | 584.2 | 482.7 | 305.6 | 216.2 | 178.0 | 161.2 | 151.0 | 144.4 | 141.6 | 137.9 | 138.8 |
| 30° | 598.2 | 483.6 | 293.5 | 203.1 | 167.7 | 151.9 | 142.6 | 134.2 | 130.5 | 128.6 | 128.6 |
| 32.5° | 612.2 | 487.3 | 281.4 | 191.0 | 157.5 | 144.4 | 133.2 | 125.8 | 121.1 | 120.2 | 119.3 |
| 35° | 627.1 | 490.1 | 270.2 | 180.8 | 149.1 | 136.0 | 124.9 | 117.4 | 113.7 | 112.7 | 112.7 |
| 37.5° | 643.9 | 494.8 | 261.8 | 171.5 | 140.7 | 127.7 | 117.4 | 110.0 | 107.2 | 106.2 | 106.2 |
| 40° | 661.6 | 502.2 | 255.3 | 163.1 | 134.2 | 120.2 | 110.9 | 104.4 | 102.5 | 101.6 | 101.6 |
| 42.5° | 679.3 | 508.8 | 249.7 | 156.5 | 127.7 | 113.7 | 106.2 | 99.7 | 96.9 | 96.9 | 96.9 |
| 45° | 696.1 | 513.4 | 244.1 | 150.0 | 121.1 | 109.0 | 100.6 | 95.0 | 92.2 | 92.2 | 92.2 |
| 47.5° | 711.0 | 518.1 | 235.7 | 143.5 | 114.6 | 102.5 | 96.0 | 90.4 | 87.6 | 87.6 | 87.6 |
| 50° | 726.8 | 520.9 | 226.4 | 135.1 | 108.1 | 97.8 | 91.3 | 84.8 | 82.9 | 82.0 | 82.0 |
| 52.5° | 739.8 | 520.9 | 214.3 | 126.7 | 100.6 | 91.3 | 85.7 | 80.1 | 77.3 | 75.5 | 75.5 |
| 55° | 749.2 | 520.9 | 201.3 | 116.5 | 93.2 | 85.7 | 80.1 | 74.5 | 70.8 | 68.0 | 68.0 |
| 57.5° | 754.8 | 518.1 | 186.4 | 104.4 | 85.7 | 78.3 | 74.5 | 68.0 | 60.6 | 55.0 | 53.1 |
| 60° | 750.1 | 509.7 | 170.5 | 91.3 | 77.3 | 71.7 | 69.0 | 60.6 | 50.3 | 47.5 | 47.5 |
| 62.5° | 730.5 | 490.1 | 154.7 | 80.1 | 70.8 | 65.2 | 62.4 | 53.1 | 45.7 | 42.9 | 42.9 |
| 65° | 675.6 | 442.6 | 135.1 | 69.9 | 63.4 | 59.6 | 55.9 | 47.5 | 41.0 | 37.3 | 37.3 |
| 67.5° | 595.4 | 382.0 | 112.7 | 61.5 | 56.8 | 54.0 | 51.2 | 42.9 | 36.3 | 32.6 | 32.6 |
| 70° | 482.7 | 308.4 | 96.0 | 54.0 | 50.3 | 48.5 | 45.7 | 39.1 | 31.7 | 28.9 | 28.9 |
| 72.5° | 379.2 | 242.3 | 80.1 | 48.5 | 46.6 | 42.9 | 41.0 | 34.5 | 28.9 | 26.1 | 26.1 |
| 75° | 282.3 | 180.8 | 70.8 | 42.9 | 42.9 | 38.2 | 37.3 | 30.7 | 25.2 | 23.3 | 23.3 |
| 77.5° | 207.8 | 134.2 | 61.5 | 37.3 | 37.3 | 33.5 | 31.7 | 27.0 | 23.3 | 21.4 | 21.4 |
| 80° | 140.7 | 91.3 | 45.7 | 28.0 | 28.0 | 27.0 | 25.2 | 23.3 | 19.6 | 17.7 | 16.8 |
| 82.5° | 59.6 | 38.2 | 22.4 | 14.0 | 13.0 | 10.2 | 8.4 | 6.5 | 6.5 | 5.6 | 5.6 |
| 85° | 10.2 | 4.7 | 4.7 | 3.7 | 2.8 | 2.8 | 2.8 | 1.9 | 1.9 | 1.9 | 1.9 |
| 87.5° | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 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 |

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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-4

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-730-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-730-U-5WQ-2

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-4
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 08/20/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: Streetworks
 Catalog Number: **MEM2-HTN-SA-40-730-U-5WQ-2**
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

Spectral Parameters

CCT (K): 3057
 CIE u': 0.2487
 CIE v': 0.5199
 Duv: -0.0002
 CIE x: 0.4326
 CIE y: 0.4020
 CIE z: 0.1654
 Peak Wavelength (nm): 593
 Dominant Wavelength (nm): 582
 Purity: 50.50735
 Rf: 74.6
 Rg: 94

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.7 | | |
| R1: | 68.1 | R9: | -34.8 |
| R2: | 82.0 | R10: | 58.5 |
| R3: | 93.5 | R11: | 62.5 |
| R4: | 67.5 | R12: | 47.5 |
| R5: | 67.2 | R13: | 70.7 |
| R6: | 74.9 | R14: | 96.4 |
| R7: | 77.4 | R15: | 60.0 |
| R8: | 43.1 | | |



Test Conditions

Stabilization Time: 21M
 Operation Time: 1H 21M
 Sphere Temperature (°C): 24.2

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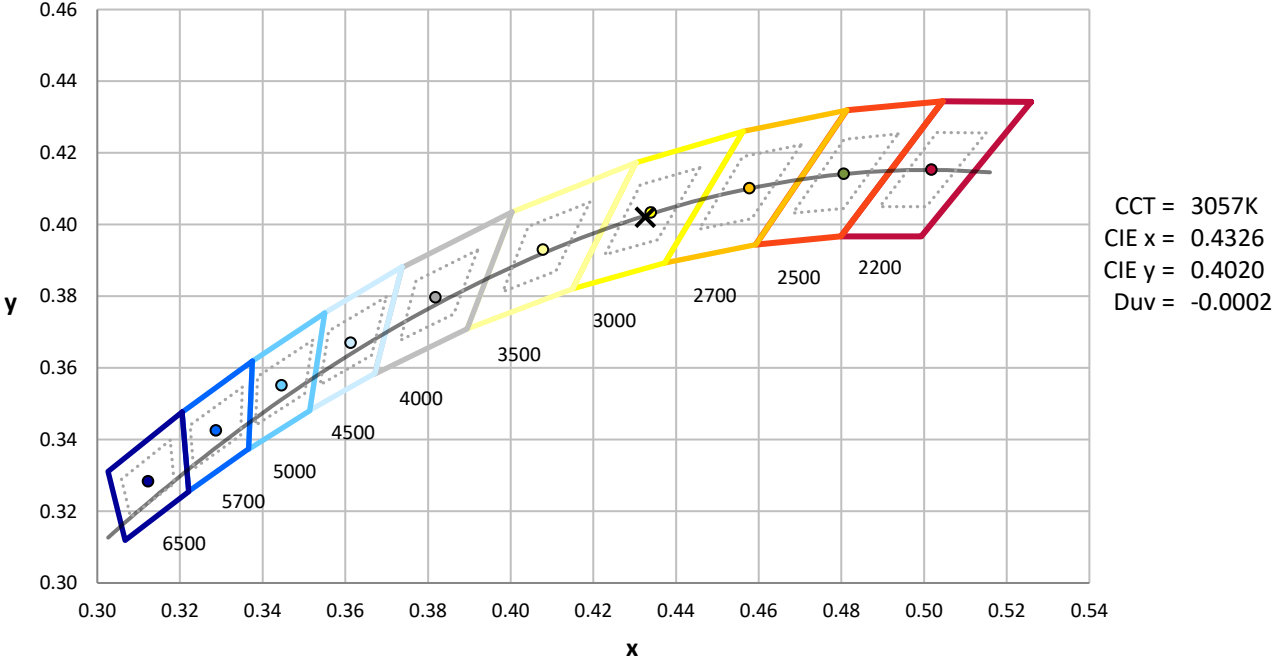
| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 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 3000K 4-step quadrangle

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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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-157-4

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.23

| 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-157-4

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.27

| 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 | 104 | NR | 620 | 818 | NR | 750 | 20 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 135 | NR | 625 | 755 | NR | 755 | 17 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 184 | NR | 630 | 691 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 247 | NR | 635 | 625 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 309 | NR | 640 | 561 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 369 | NR | 645 | 499 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 419 | NR | 650 | 441 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 460 | NR | 655 | 388 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 492 | NR | 660 | 338 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 524 | NR | 665 | 294 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 7 | NR | 540 | 553 | NR | 670 | 253 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 15 | NR | 545 | 588 | NR | 675 | 218 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 31 | NR | 550 | 625 | NR | 680 | 188 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 60 | NR | 555 | 670 | NR | 685 | 161 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 107 | NR | 560 | 723 | NR | 690 | 139 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 183 | NR | 565 | 780 | NR | 695 | 118 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 289 | NR | 570 | 837 | NR | 700 | 100 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 894 | NR | 705 | 85 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 646 | NR | 580 | 942 | NR | 710 | 73 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 561 | NR | 585 | 976 | NR | 715 | 62 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 331 | NR | 590 | 998 | NR | 720 | 53 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 238 | NR | 595 | 1000 | NR | 725 | 45 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 178 | NR | 600 | 990 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 120 | NR | 605 | 962 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 96 | NR | 610 | 925 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 95 | NR | 615 | 873 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

Summary

$R_f = 74.6$
 $R_g = 94$
 $CIE R_a = 71.7$
 $R_9 = -34.8$



Color Vector Graphics



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

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 65 | CES51 = 87 | CES76 = 58 |
| CES02 = 62 | CES27 = 89 | CES52 = 85 | CES77 = 76 |
| CES03 = 31 | CES28 = 84 | CES53 = 77 | CES78 = 61 |
| CES04 = 71 | CES29 = 68 | CES54 = 85 | CES79 = 86 |
| CES05 = 49 | CES30 = 83 | CES55 = 84 | CES80 = 83 |
| CES06 = 51 | CES31 = 71 | CES56 = 74 | CES81 = 73 |
| CES07 = 41 | CES32 = 64 | CES57 = 74 | CES82 = 93 |
| CES08 = 40 | CES33 = 78 | CES58 = 75 | CES83 = 91 |
| CES09 = 29 | CES34 = 75 | CES59 = 85 | CES84 = 88 |
| CES10 = 76 | CES35 = 87 | CES60 = 90 | CES85 = 75 |
| CES11 = 59 | CES36 = 92 | CES61 = 81 | CES86 = 64 |
| CES12 = 65 | CES37 = 84 | CES62 = 89 | CES87 = 77 |
| CES13 = 43 | CES38 = 92 | CES63 = 75 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 65 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 64 | CES90 = 80 |
| CES16 = 47 | CES41 = 93 | CES66 = 60 | CES91 = 78 |
| CES17 = 50 | CES42 = 86 | CES67 = 58 | CES92 = 56 |
| CES18 = 56 | CES43 = 77 | CES68 = 66 | CES93 = 73 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 60 | CES95 = 66 |
| CES21 = 87 | CES46 = 81 | CES71 = 56 | CES96 = 76 |
| CES22 = 79 | CES47 = 86 | CES72 = 85 | CES97 = 82 |
| CES23 = 92 | CES48 = 75 | CES73 = 52 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 95 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 60 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)