

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



Scaled data based on original data using
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions

Brand: STREETWORKS

Report Number: P362714

Luminaire Tested: NVN-SA4D-722-U-T2R-HSS

Issue Date: 3/3/2020

Test Information

Test Method: LM-79-2019
Report Number: P362714
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9)
Test Lab: INNOVATION CENTER
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: STREETWORKS
Catalog Number: NVN-SA4D-722-U-T2R-HSS
Description: NAVION ROADWAY AND AREA LUMINAIRE
(4) 70 CRI, 2200K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II
ROADWAY OPTICS WITH HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 18982 lumens
Efficiency: N/A
Efficacy: 73.6 lumens/watt
Luminous Opening: Rectangular (W 1' x L: 1.5' x H: 0')
IES Classification: Type II - Medium
BUG Rating: B1 - U0 - G2

Input Watts (W): 258
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

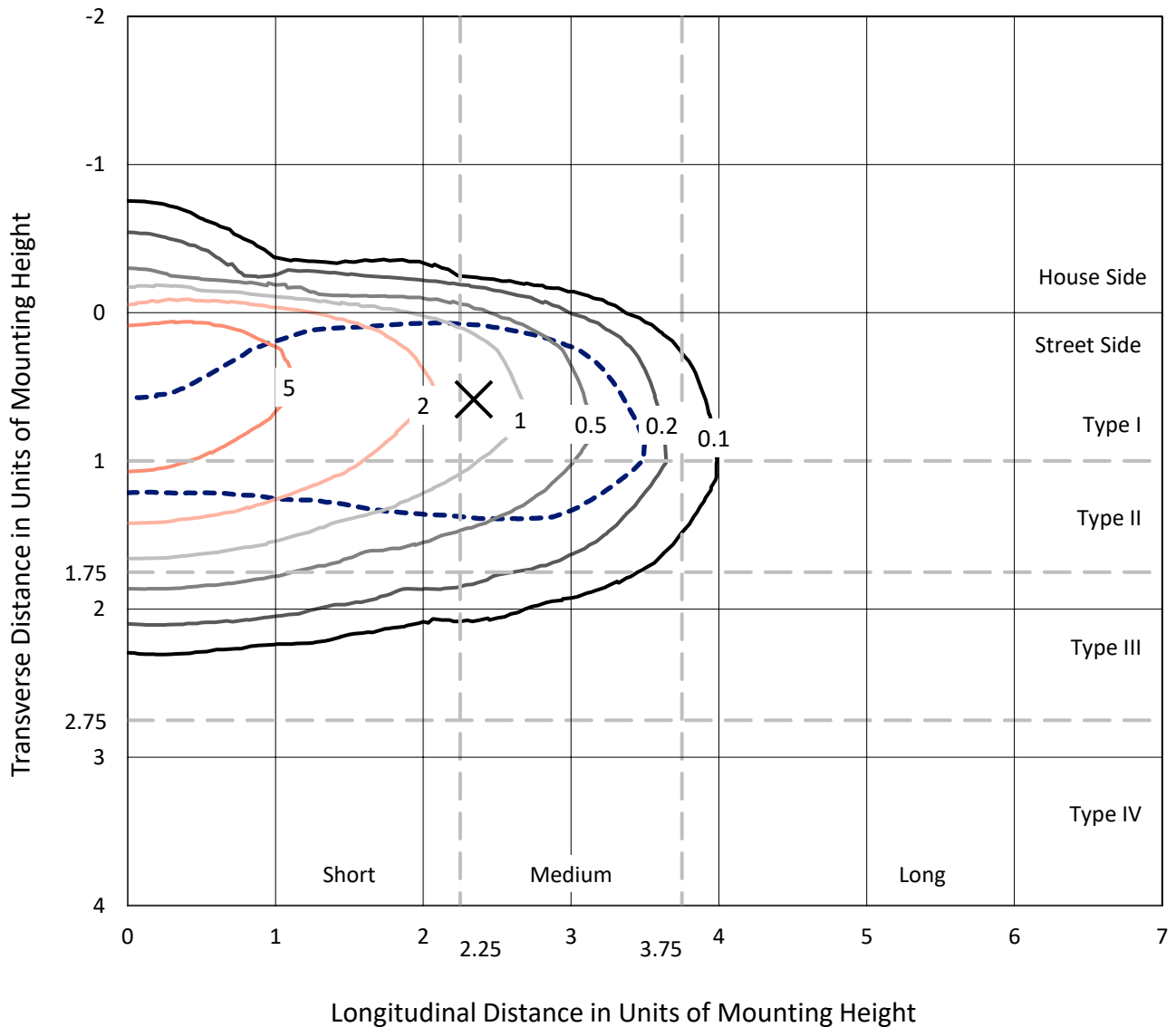




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Iso-Footcandle Lines of Horizontal Illumination

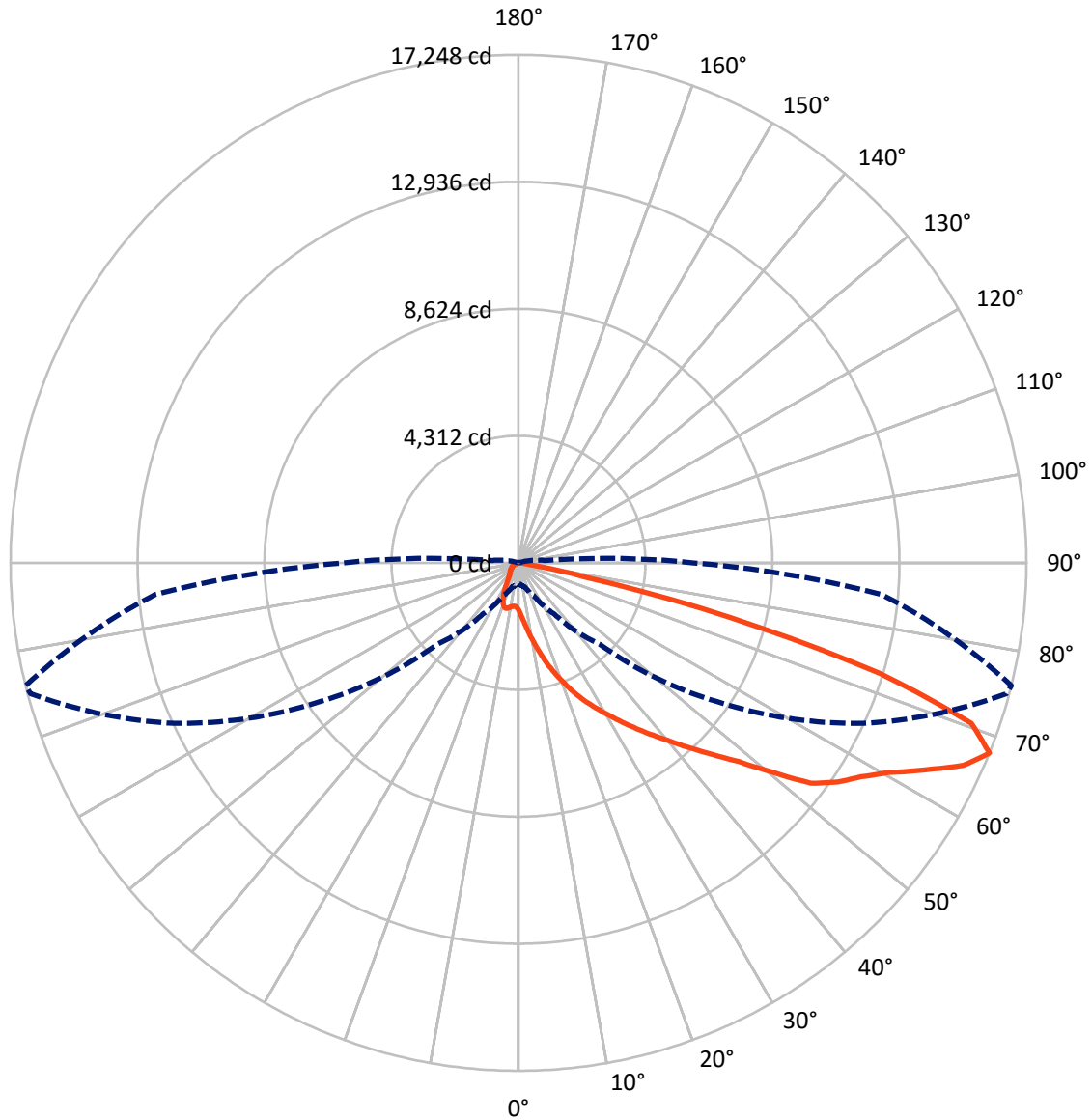
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 9.1 fc
 Type II - Medium - N/A

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Luminous Intensity Polar Plot



— Vertical Plane Through 76-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

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FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 942.6 | 0.0 | 942.6 |
| | % Fixture | 5.0 | 0.0 | 5.0 |
| Street Side | Lumens | 18039.4 | 0.0 | 18039.4 |
| | % Fixture | 95.0 | 0.0 | 95.0 |
| Total | Lumens | 18982.0 | 0.0 | 18982.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 200.2 | 1.1 |
| 10°-20° | 793.7 | 4.2 |
| 20°-30° | 1615.0 | 8.5 |
| 30°-40° | 2803.1 | 14.8 |
| 40°-50° | 3960.4 | 20.9 |
| 50°-60° | 4491.3 | 23.7 |
| 60°-70° | 3725.1 | 19.6 |
| 70°-80° | 1349.3 | 7.1 |
| 80°-90° | 43.8 | 0.2 |
| 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° | 18982.0 | 100.0 |
| 0°-180° | 18982.0 | 100.0 |

Coefficient of Utilization

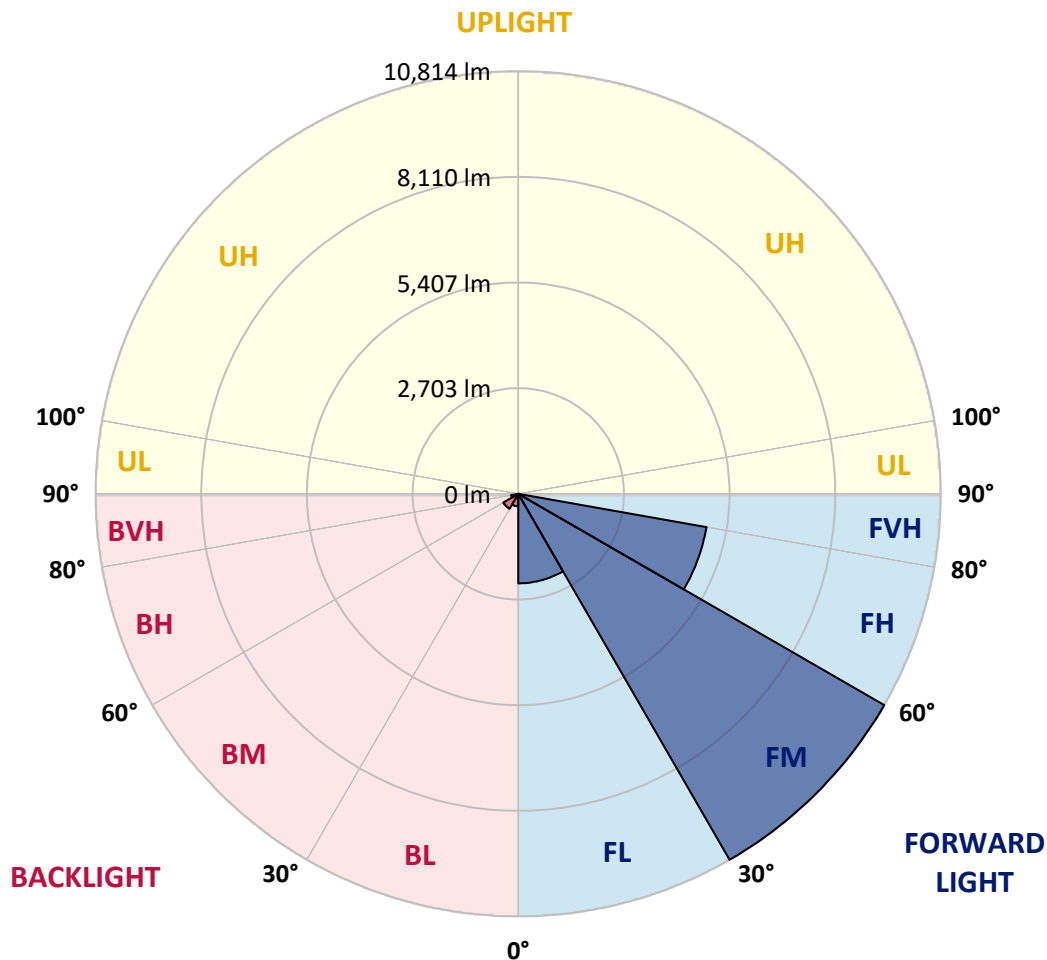


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LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|---------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 2291.1 | 12.1 | | | |
| FM (30°-60°) | 10813.7 | 57.0 | | | |
| FH (60°-80°) | 4892.3 | 25.8 | | | G2/5000 |
| FVH (80°-90°) | 42.4 | 0.2 | | | G1/100 |
| BL (0°-30°) | 317.9 | 1.7 | B1/500 | | |
| BM (30°-60°) | 441.2 | 2.3 | B1/1000 | | |
| BH (60°-80°) | 182.2 | 1.0 | B1/500 | | G1/500 |
| BVH (80°-90°) | 1.4 | 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-G2
 Type II Medium





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 76° | 85° |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0° | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 |
| 2.5° | 2403.7 | 2349.6 | 2362.1 | 2327.2 | 2264.0 | 2134.2 | 2023.6 | 1918.8 | 1796.5 | 1792.4 | 1691.7 |
| 5° | 3241.2 | 3195.5 | 3189.7 | 3119.0 | 3004.2 | 2783.8 | 2569.2 | 2324.7 | 2051.9 | 2031.9 | 1818.2 |
| 7.5° | 4001.4 | 3964.8 | 3951.5 | 3867.5 | 3653.8 | 3439.2 | 3159.7 | 2800.4 | 2373.7 | 2337.2 | 1988.7 |
| 10° | 4585.3 | 4567.8 | 4571.2 | 4511.3 | 4328.3 | 4128.7 | 3761.9 | 3303.6 | 2738.9 | 2682.3 | 2193.3 |
| 12.5° | 5027.8 | 5031.9 | 5061.9 | 5025.3 | 4923.0 | 4774.9 | 4383.2 | 3840.1 | 3143.1 | 3065.7 | 2427.0 |
| 15° | 5353.0 | 5373.8 | 5428.7 | 5474.4 | 5466.9 | 5338.9 | 4979.5 | 4384.9 | 3572.3 | 3486.6 | 2687.3 |
| 17.5° | 5563.4 | 5586.7 | 5666.6 | 5768.0 | 5861.2 | 5831.2 | 5555.1 | 4910.5 | 4006.4 | 3907.5 | 2965.9 |
| 20° | 5748.1 | 5775.5 | 5861.2 | 5995.1 | 6168.9 | 6206.3 | 6025.0 | 5420.4 | 4439.8 | 4319.2 | 3253.7 |
| 22.5° | 6148.1 | 6147.3 | 6199.7 | 6277.9 | 6443.4 | 6539.9 | 6425.1 | 5893.6 | 4868.1 | 4742.5 | 3547.3 |
| 25° | 6871.7 | 6844.3 | 6826.0 | 6764.4 | 6801.0 | 6860.9 | 6796.9 | 6336.1 | 5298.9 | 5171.7 | 3845.1 |
| 27.5° | 7731.7 | 7748.4 | 7600.3 | 7434.8 | 7306.7 | 7245.2 | 7140.4 | 6746.1 | 5713.1 | 5573.4 | 4136.2 |
| 30° | 8639.1 | 8644.1 | 8469.5 | 8258.2 | 7976.3 | 7742.5 | 7561.2 | 7137.9 | 6139.0 | 5986.8 | 4419.0 |
| 32.5° | 9457.6 | 9425.1 | 9252.1 | 8964.4 | 8608.4 | 8345.5 | 7968.8 | 7575.4 | 6589.8 | 6442.6 | 4733.4 |
| 35° | 10106.3 | 10068.1 | 9857.6 | 9595.6 | 9226.3 | 8961.9 | 8508.6 | 8012.0 | 7063.9 | 6920.0 | 5048.6 |
| 37.5° | 10580.4 | 10535.5 | 10319.2 | 10049.8 | 9731.2 | 9577.3 | 9134.9 | 8486.9 | 7581.2 | 7426.5 | 5380.4 |
| 40° | 10745.1 | 10706.0 | 10570.4 | 10373.3 | 10117.1 | 10082.2 | 9799.4 | 9033.4 | 8144.3 | 7979.6 | 5756.4 |
| 42.5° | 10646.9 | 10608.7 | 10560.4 | 10493.9 | 10387.4 | 10420.7 | 10426.5 | 9656.3 | 8769.7 | 8607.5 | 6171.4 |
| 45° | 10257.7 | 10223.6 | 10273.5 | 10370.8 | 10503.0 | 10667.7 | 10998.8 | 10325.9 | 9468.4 | 9295.4 | 6651.3 |
| 47.5° | 9684.6 | 9659.7 | 9797.7 | 10040.6 | 10427.4 | 10881.5 | 11521.9 | 11029.5 | 10252.7 | 10092.2 | 7250.2 |
| 50° | 8869.5 | 8865.4 | 9141.5 | 9584.8 | 10179.5 | 10984.6 | 12062.5 | 11829.7 | 11342.3 | 11173.4 | 8082.7 |
| 52.5° | 7600.3 | 7608.6 | 8151.8 | 8861.2 | 9744.5 | 10914.8 | 12410.2 | 12857.7 | 12609.8 | 12434.3 | 8803.8 |
| 55° | 6391.8 | 6441.7 | 6826.8 | 7849.8 | 9077.5 | 10655.3 | 12530.0 | 13337.6 | 13309.3 | 13142.9 | 9204.7 |
| 57.5° | 5208.3 | 5298.9 | 5669.9 | 6625.5 | 8103.5 | 10057.2 | 12464.3 | 13545.5 | 13830.0 | 13702.7 | 9733.7 |
| 60° | 3925.8 | 3967.3 | 4394.8 | 5288.1 | 6853.4 | 8966.0 | 11987.7 | 13658.6 | 14541.9 | 14453.8 | 10501.4 |
| 62.5° | 2497.7 | 2601.6 | 2980.9 | 3842.6 | 5336.4 | 7450.6 | 11184.2 | 13657.0 | 15432.7 | 15480.9 | 11492.0 |
| 65° | 1315.8 | 1437.2 | 1638.5 | 2381.2 | 3667.1 | 5758.0 | 9975.7 | 13528.9 | 16525.6 | 16593.0 | 12266.3 |
| 67.5° | 709.5 | 744.4 | 850.9 | 1235.9 | 2126.7 | 3900.8 | 8200.0 | 12896.8 | 17158.5 | 17247.5 | 12374.4 |
| 70° | 519.0 | 538.1 | 578.1 | 683.7 | 1070.4 | 2265.6 | 5983.4 | 11463.7 | 16342.6 | 16309.3 | 10994.6 |
| 72.5° | 398.4 | 428.3 | 458.3 | 500.7 | 615.5 | 1209.3 | 3725.3 | 8976.8 | 13039.8 | 12820.2 | 8218.3 |
| 75° | 314.4 | 319.4 | 361.8 | 400.1 | 461.6 | 688.7 | 1654.3 | 5228.2 | 7958.8 | 7439.0 | 4261.8 |
| 77.5° | 251.2 | 254.5 | 279.5 | 312.7 | 371.0 | 452.5 | 512.3 | 2056.9 | 2540.9 | 2267.3 | 924.9 |
| 80° | 148.9 | 157.2 | 207.9 | 241.2 | 307.7 | 285.3 | 187.1 | 446.6 | 396.7 | 359.3 | 155.5 |
| 82.5° | 83.2 | 89.8 | 117.3 | 190.5 | 214.6 | 136.4 | 93.2 | 120.6 | 93.2 | 90.7 | 44.1 |
| 85° | 0.0 | 4.2 | 75.7 | 118.1 | 87.3 | 29.9 | 39.1 | 39.9 | 27.4 | 25.8 | 17.5 |
| 87.5° | 0.0 | 0.0 | 23.3 | 22.5 | 3.3 | 5.0 | 9.1 | 13.3 | 10.8 | 10.8 | 9.1 |
| 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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 CATALOG NUMBER: NVN-SA4D-722-U-T2R-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 | 1610.2 |
| 2.5° | 1641.8 | 1596.9 | 1512.1 | 1428.9 | 1359.0 | 1301.7 | 1250.1 | 1229.3 | 1212.7 | 1210.2 | 1196.9 |
| 5° | 1715.0 | 1624.4 | 1462.2 | 1329.1 | 1240.1 | 1176.9 | 1122.8 | 1089.6 | 1063.8 | 1053.8 | 1044.6 |
| 7.5° | 1825.6 | 1688.4 | 1455.5 | 1302.5 | 1196.0 | 1089.6 | 989.8 | 881.6 | 814.3 | 788.5 | 773.5 |
| 10° | 1960.4 | 1773.2 | 1480.5 | 1295.0 | 1108.7 | 884.1 | 718.6 | 581.4 | 525.7 | 507.4 | 502.4 |
| 12.5° | 2117.6 | 1878.9 | 1523.7 | 1248.4 | 922.4 | 628.0 | 495.7 | 449.1 | 436.7 | 430.8 | 430.8 |
| 15° | 2298.1 | 1994.5 | 1554.5 | 1113.7 | 682.0 | 474.9 | 429.2 | 407.5 | 394.2 | 386.8 | 387.6 |
| 17.5° | 2482.7 | 2107.6 | 1539.5 | 918.2 | 503.2 | 422.5 | 388.4 | 365.1 | 346.8 | 339.3 | 337.7 |
| 20° | 2669.0 | 2212.4 | 1456.4 | 683.7 | 425.8 | 383.4 | 345.2 | 319.4 | 301.1 | 293.6 | 291.9 |
| 22.5° | 2862.0 | 2301.4 | 1310.0 | 501.5 | 382.6 | 340.2 | 302.7 | 277.0 | 259.5 | 252.8 | 249.5 |
| 25° | 3049.9 | 2373.7 | 1105.4 | 405.9 | 341.8 | 299.4 | 263.7 | 239.5 | 223.7 | 217.1 | 216.2 |
| 27.5° | 3225.4 | 2419.5 | 868.3 | 358.5 | 306.1 | 262.8 | 230.4 | 208.8 | 195.5 | 190.5 | 189.6 |
| 30° | 3383.5 | 2423.7 | 642.1 | 323.5 | 274.5 | 231.2 | 201.3 | 182.1 | 170.5 | 165.5 | 163.9 |
| 32.5° | 3543.2 | 2388.7 | 467.4 | 291.9 | 245.4 | 203.8 | 174.7 | 159.7 | 151.4 | 147.2 | 147.2 |
| 35° | 3693.7 | 2308.0 | 364.3 | 264.5 | 217.1 | 177.2 | 153.9 | 143.1 | 138.1 | 133.9 | 133.9 |
| 37.5° | 3840.9 | 2192.4 | 309.4 | 240.4 | 190.5 | 154.7 | 135.6 | 128.9 | 124.8 | 120.6 | 120.6 |
| 40° | 3990.6 | 2046.9 | 281.1 | 217.9 | 168.8 | 137.2 | 120.6 | 114.8 | 110.6 | 107.3 | 106.5 |
| 42.5° | 4174.4 | 1878.9 | 262.8 | 197.1 | 149.7 | 121.4 | 106.5 | 99.8 | 96.5 | 93.2 | 91.5 |
| 45° | 4387.4 | 1734.2 | 247.9 | 176.3 | 133.9 | 108.1 | 92.3 | 85.7 | 80.7 | 76.5 | 75.7 |
| 47.5° | 4694.3 | 1629.4 | 227.9 | 153.9 | 118.9 | 94.0 | 79.8 | 72.4 | 64.9 | 60.7 | 59.9 |
| 50° | 5086.0 | 1542.9 | 202.1 | 133.9 | 104.0 | 79.8 | 66.5 | 57.4 | 50.7 | 46.6 | 46.6 |
| 52.5° | 5280.6 | 1429.7 | 178.8 | 116.4 | 87.3 | 67.4 | 54.1 | 43.2 | 39.9 | 35.8 | 35.8 |
| 55° | 5358.8 | 1343.2 | 155.5 | 99.0 | 72.4 | 55.7 | 42.4 | 33.3 | 30.8 | 28.3 | 27.4 |
| 57.5° | 5578.4 | 1318.3 | 135.6 | 84.0 | 59.9 | 44.1 | 32.4 | 25.0 | 23.3 | 20.0 | 20.0 |
| 60° | 5931.9 | 1330.8 | 117.3 | 71.5 | 48.2 | 34.1 | 24.1 | 19.1 | 17.5 | 14.1 | 14.1 |
| 62.5° | 6313.6 | 1315.0 | 99.0 | 61.5 | 37.4 | 25.0 | 16.6 | 14.1 | 14.1 | 8.3 | 7.5 |
| 65° | 6386.8 | 1171.1 | 84.8 | 50.7 | 29.1 | 18.3 | 10.8 | 9.1 | 12.5 | 1.7 | 0.0 |
| 67.5° | 5927.7 | 908.2 | 73.2 | 39.1 | 21.6 | 14.1 | 8.3 | 4.2 | 10.8 | 0.0 | 0.0 |
| 70° | 4740.0 | 577.2 | 59.1 | 28.3 | 16.6 | 11.6 | 6.7 | 1.7 | 8.3 | 0.0 | 0.0 |
| 72.5° | 3351.9 | 335.2 | 46.6 | 20.0 | 14.1 | 9.1 | 5.0 | 0.0 | 5.0 | 0.0 | 0.0 |
| 75° | 1695.1 | 178.8 | 29.1 | 15.0 | 10.8 | 6.7 | 3.3 | 0.0 | 0.8 | 0.0 | 0.0 |
| 77.5° | 366.8 | 83.2 | 18.3 | 10.8 | 7.5 | 4.2 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 80° | 79.8 | 36.6 | 11.6 | 6.7 | 4.2 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 29.1 | 19.1 | 5.8 | 3.3 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 15.8 | 10.0 | 3.3 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 8.3 | 3.3 | 0.8 | 0.8 | 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 |

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



LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-10-R4

Test Date: 10/25/2019

Luminaire Tested: SA1C-722-U-5WQ

Data in this report applies to families of products SA1C-722-U-5WQ.

Test Information

Test Method: LM-79-2008 Report
 Number: SP1-1908-441-10-R4
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/28/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: McGRAW-EDISON
 Catalog Number: **SA1C-722-U-5WQ**
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

Spectral Parameters

CCT (K): 2237
 CIE u': 0.2876
 CIE v': 0.5346
 Duv: -0.0006
 CIE x: 0.5005
 CIE y: 0.4134
 CIE z: 0.0860
 Peak Wavelength (nm): 603
 Dominant Wavelength (nm): 587
 Purity: 74.5
 Rf: 69.8
 Rg: 99.2

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 72.0 | | |
| R1: | 68.9 | R9: | -17.4 |
| R2: | 83.0 | R10: | 61.3 |
| R3: | 95.2 | R11: | 59.8 |
| R4: | 66.2 | R12: | 50.5 |
| R5: | 65.9 | R13: | 71.1 |
| R6: | 76.3 | R14: | 96.9 |
| R7: | 76.7 | | |
| R8: | 43.8 | | |



Test Conditions

Stabilization Time: 71M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 24.7/41%
 Sphere Temperature (°C): 25.6

REPORT NUMBER: SP1-1908-441-10-R4

| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/28/2019 | 12/28/2019 |
| Power Meter | IN0071 | 12/5/2018 | 12/5/2019 |
| AC Power Source | IN0063 | 12/5/2018 | 12/5/2019 |
| DC Power Source | IN0208 | 12/5/2018 | 12/5/2019 |
| Sphere Thermometer | IN0085 | 12/5/2018 | 12/5/2019 |
| Room Thermometer | IN0046 | 12/5/2018 | 12/5/2019 |

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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 2200K 4-step quadrangle

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Photopic Flux vs. Wavelength



#####

| 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 | 1768 | NR | 490 | 5206 | NR | 620 | 130919 | NR | 750 | 8553 | NR | 880 | 2713 | NR |
| 365 | 1569 | NR | 495 | 7286 | NR | 625 | 125335 | NR | 755 | 7696 | NR | 885 | 2316 | NR |
| 370 | 1594 | NR | 500 | 10654 | NR | 630 | 118388 | NR | 760 | 6978 | NR | 890 | 2539 | NR |
| 375 | 1744 | NR | 505 | 15189 | NR | 635 | 111855 | NR | 765 | 6377 | NR | 895 | 1933 | NR |
| 380 | 1659 | NR | 510 | 20541 | NR | 640 | 104062 | NR | 770 | 5600 | NR | 900 | 2216 | NR |
| 385 | 1504 | NR | 515 | 26492 | NR | 645 | 96365 | NR | 775 | 5000 | NR | 905 | 2067 | NR |
| 390 | 1541 | NR | 520 | 32294 | NR | 650 | 88651 | NR | 780 | 4709 | NR | 910 | 1959 | NR |
| 395 | 1355 | NR | 525 | 38123 | NR | 655 | 81152 | NR | 785 | 4305 | NR | 915 | 1874 | NR |
| 400 | 1243 | NR | 530 | 43232 | NR | 660 | 73523 | NR | 790 | 4040 | NR | 920 | 1484 | NR |
| 405 | 1417 | NR | 535 | 48012 | NR | 665 | 66123 | NR | 795 | 3642 | NR | 925 | 1914 | NR |
| 410 | 2147 | NR | 540 | 52623 | NR | 670 | 58677 | NR | 800 | 3594 | NR | 930 | 1948 | NR |
| 415 | 3837 | NR | 545 | 57516 | NR | 675 | 52349 | NR | 805 | 3190 | NR | 935 | 2079 | NR |
| 420 | 7159 | NR | 550 | 62613 | NR | 680 | 46159 | NR | 810 | 3241 | NR | 940 | 2263 | NR |
| 425 | 12599 | NR | 555 | 68554 | NR | 685 | 40525 | NR | 815 | 2732 | NR | 945 | 1688 | NR |
| 430 | 19019 | NR | 560 | 75325 | NR | 690 | 35615 | NR | 820 | 2612 | NR | 950 | 1560 | NR |
| 435 | 24875 | NR | 565 | 82533 | NR | 695 | 31158 | NR | 825 | 2966 | NR | 955 | 2826 | NR |
| 440 | 29103 | NR | 570 | 90909 | NR | 700 | 27409 | NR | 830 | 2574 | NR | 960 | 1477 | NR |
| 445 | 29901 | NR | 575 | 99621 | NR | 705 | 24204 | NR | 835 | 2633 | NR | 965 | 1568 | NR |
| 450 | 24862 | NR | 580 | 108484 | NR | 710 | 21558 | NR | 840 | 2526 | NR | 970 | 2030 | NR |
| 455 | 15942 | NR | 585 | 116679 | NR | 715 | 19222 | NR | 845 | 2631 | NR | 975 | 1986 | NR |
| 460 | 9916 | NR | 590 | 123752 | NR | 720 | 17310 | NR | 850 | 2079 | NR | 980 | 2540 | NR |
| 465 | 7051 | NR | 595 | 129324 | NR | 725 | 15280 | NR | 855 | 2309 | NR | 985 | 1139 | NR |
| 470 | 5227 | NR | 600 | 134082 | NR | 730 | 13282 | NR | 860 | 2528 | NR | 990 | 2018 | NR |
| 475 | 4257 | NR | 605 | 135698 | NR | 735 | 11753 | NR | 865 | 2121 | NR | 995 | 3445 | NR |
| 480 | 4052 | NR | 610 | 135144 | NR | 740 | 10654 | NR | 870 | 2751 | NR | 1000 | 3704 | NR |
| 485 | 4298 | NR | 615 | 134180 | NR | 745 | 9451 | NR | 875 | 2317 | NR | | | |

REPORT NUMBER: SP1-1908-441-10-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 4696.9

S/P: 0.85

| 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 | 1768 | NR | 490 | 5206 | NR | 620 | 130919 | NR | 750 | 8553 | NR | 880 | 2713 | NR |
| 365 | 1569 | NR | 495 | 7286 | NR | 625 | 125335 | NR | 755 | 7696 | NR | 885 | 2316 | NR |
| 370 | 1594 | NR | 500 | 10654 | NR | 630 | 118388 | NR | 760 | 6978 | NR | 890 | 2539 | NR |
| 375 | 1744 | NR | 505 | 15189 | NR | 635 | 111855 | NR | 765 | 6377 | NR | 895 | 1933 | NR |
| 380 | 1659 | NR | 510 | 20541 | NR | 640 | 104062 | NR | 770 | 5600 | NR | 900 | 2216 | NR |
| 385 | 1504 | NR | 515 | 26492 | NR | 645 | 96365 | NR | 775 | 5000 | NR | 905 | 2067 | NR |
| 390 | 1541 | NR | 520 | 32294 | NR | 650 | 88651 | NR | 780 | 4709 | NR | 910 | 1959 | NR |
| 395 | 1355 | NR | 525 | 38123 | NR | 655 | 81152 | NR | 785 | 4305 | NR | 915 | 1874 | NR |
| 400 | 1243 | NR | 530 | 43232 | NR | 660 | 73523 | NR | 790 | 4040 | NR | 920 | 1484 | NR |
| 405 | 1417 | NR | 535 | 48012 | NR | 665 | 66123 | NR | 795 | 3642 | NR | 925 | 1914 | NR |
| 410 | 2147 | NR | 540 | 52623 | NR | 670 | 58677 | NR | 800 | 3594 | NR | 930 | 1948 | NR |
| 415 | 3837 | NR | 545 | 57516 | NR | 675 | 52349 | NR | 805 | 3190 | NR | 935 | 2079 | NR |
| 420 | 7159 | NR | 550 | 62613 | NR | 680 | 46159 | NR | 810 | 3241 | NR | 940 | 2263 | NR |
| 425 | 12599 | NR | 555 | 68554 | NR | 685 | 40525 | NR | 815 | 2732 | NR | 945 | 1688 | NR |
| 430 | 19019 | NR | 560 | 75325 | NR | 690 | 35615 | NR | 820 | 2612 | NR | 950 | 1560 | NR |
| 435 | 24875 | NR | 565 | 82533 | NR | 695 | 31158 | NR | 825 | 2966 | NR | 955 | 2826 | NR |
| 440 | 29103 | NR | 570 | 90909 | NR | 700 | 27409 | NR | 830 | 2574 | NR | 960 | 1477 | NR |
| 445 | 29901 | NR | 575 | 99621 | NR | 705 | 24204 | NR | 835 | 2633 | NR | 965 | 1568 | NR |
| 450 | 24862 | NR | 580 | 108484 | NR | 710 | 21558 | NR | 840 | 2526 | NR | 970 | 2030 | NR |
| 455 | 15942 | NR | 585 | 116679 | NR | 715 | 19222 | NR | 845 | 2631 | NR | 975 | 1986 | NR |
| 460 | 9916 | NR | 590 | 123752 | NR | 720 | 17310 | NR | 850 | 2079 | NR | 980 | 2540 | NR |
| 465 | 7051 | NR | 595 | 129324 | NR | 725 | 15280 | NR | 855 | 2309 | NR | 985 | 1139 | NR |
| 470 | 5227 | NR | 600 | 134082 | NR | 730 | 13282 | NR | 860 | 2528 | NR | 990 | 2018 | NR |
| 475 | 4257 | NR | 605 | 135698 | NR | 735 | 11753 | NR | 865 | 2121 | NR | 995 | 3445 | NR |
| 480 | 4052 | NR | 610 | 135144 | NR | 740 | 10654 | NR | 870 | 2751 | NR | 1000 | 3704 | NR |
| 485 | 4298 | NR | 615 | 134180 | NR | 745 | 9451 | NR | 875 | 2317 | NR | | | |

REPORT NUMBER: SP1-1908-441-10-R4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 1470.8 M/P: 0.27

| 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 | 1768 | NR | 490 | 5206 | NR | 620 | 130919 | NR | 750 | 8553 | NR | 880 | 2713 | NR |
| 365 | 1569 | NR | 495 | 7286 | NR | 625 | 125335 | NR | 755 | 7696 | NR | 885 | 2316 | NR |
| 370 | 1594 | NR | 500 | 10654 | NR | 630 | 118388 | NR | 760 | 6978 | NR | 890 | 2539 | NR |
| 375 | 1744 | NR | 505 | 15189 | NR | 635 | 111855 | NR | 765 | 6377 | NR | 895 | 1933 | NR |
| 380 | 1659 | NR | 510 | 20541 | NR | 640 | 104062 | NR | 770 | 5600 | NR | 900 | 2216 | NR |
| 385 | 1504 | NR | 515 | 26492 | NR | 645 | 96365 | NR | 775 | 5000 | NR | 905 | 2067 | NR |
| 390 | 1541 | NR | 520 | 32294 | NR | 650 | 88651 | NR | 780 | 4709 | NR | 910 | 1959 | NR |
| 395 | 1355 | NR | 525 | 38123 | NR | 655 | 81152 | NR | 785 | 4305 | NR | 915 | 1874 | NR |
| 400 | 1243 | NR | 530 | 43232 | NR | 660 | 73523 | NR | 790 | 4040 | NR | 920 | 1484 | NR |
| 405 | 1417 | NR | 535 | 48012 | NR | 665 | 66123 | NR | 795 | 3642 | NR | 925 | 1914 | NR |
| 410 | 2147 | NR | 540 | 52623 | NR | 670 | 58677 | NR | 800 | 3594 | NR | 930 | 1948 | NR |
| 415 | 3837 | NR | 545 | 57516 | NR | 675 | 52349 | NR | 805 | 3190 | NR | 935 | 2079 | NR |
| 420 | 7159 | NR | 550 | 62613 | NR | 680 | 46159 | NR | 810 | 3241 | NR | 940 | 2263 | NR |
| 425 | 12599 | NR | 555 | 68554 | NR | 685 | 40525 | NR | 815 | 2732 | NR | 945 | 1688 | NR |
| 430 | 19019 | NR | 560 | 75325 | NR | 690 | 35615 | NR | 820 | 2612 | NR | 950 | 1560 | NR |
| 435 | 24875 | NR | 565 | 82533 | NR | 695 | 31158 | NR | 825 | 2966 | NR | 955 | 2826 | NR |
| 440 | 29103 | NR | 570 | 90909 | NR | 700 | 27409 | NR | 830 | 2574 | NR | 960 | 1477 | NR |
| 445 | 29901 | NR | 575 | 99621 | NR | 705 | 24204 | NR | 835 | 2633 | NR | 965 | 1568 | NR |
| 450 | 24862 | NR | 580 | 108484 | NR | 710 | 21558 | NR | 840 | 2526 | NR | 970 | 2030 | NR |
| 455 | 15942 | NR | 585 | 116679 | NR | 715 | 19222 | NR | 845 | 2631 | NR | 975 | 1986 | NR |
| 460 | 9916 | NR | 590 | 123752 | NR | 720 | 17310 | NR | 850 | 2079 | NR | 980 | 2540 | NR |
| 465 | 7051 | NR | 595 | 129324 | NR | 725 | 15280 | NR | 855 | 2309 | NR | 985 | 1139 | NR |
| 470 | 5227 | NR | 600 | 134082 | NR | 730 | 13282 | NR | 860 | 2528 | NR | 990 | 2018 | NR |
| 475 | 4257 | NR | 605 | 135698 | NR | 735 | 11753 | NR | 865 | 2121 | NR | 995 | 3445 | NR |
| 480 | 4052 | NR | 610 | 135144 | NR | 740 | 10654 | NR | 870 | 2751 | NR | 1000 | 3704 | NR |
| 485 | 4298 | NR | 615 | 134180 | NR | 745 | 9451 | NR | 875 | 2317 | NR | | | |

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Summary

$R_f = 69.8$
 $R_g = 99.2$
 $CIE R_a = 72.0$
 $R_9 = -17.4$



Color Vector Graphics



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

| | | | |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 56 | CES51 = 74 | CES76 = 56 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 83 | CES53 = 65 | CES78 = 63 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 84 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 51 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 42 | CES33 = 53 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 70 | CES59 = 84 | CES84 = 92 |
| CES10 = 78 | CES35 = 85 | CES60 = 90 | CES85 = 81 |
| CES11 = 61 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 70 | CES87 = 78 |
| CES13 = 45 | CES38 = 53 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 84 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 69 | CES93 = 79 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 63 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 63 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 56 | CES98 = 71 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 | |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)