

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: P868784

Luminaire Tested: **EMM2-HSN-SA2B-740-U-T1**

Issue Date: 08/22/2024



Test Information

Test Method: LM-79-08
Report Number: P868784
Test Lab: INNOVATION CENTER(G3)
Issue Date: 08/22/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-SA2B-740-U-T1
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 100W 70CRI 4000K
FITXURE w/ TYPE 1 DISTRIBUTION OPTIC
Light Source: (20) 4000K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

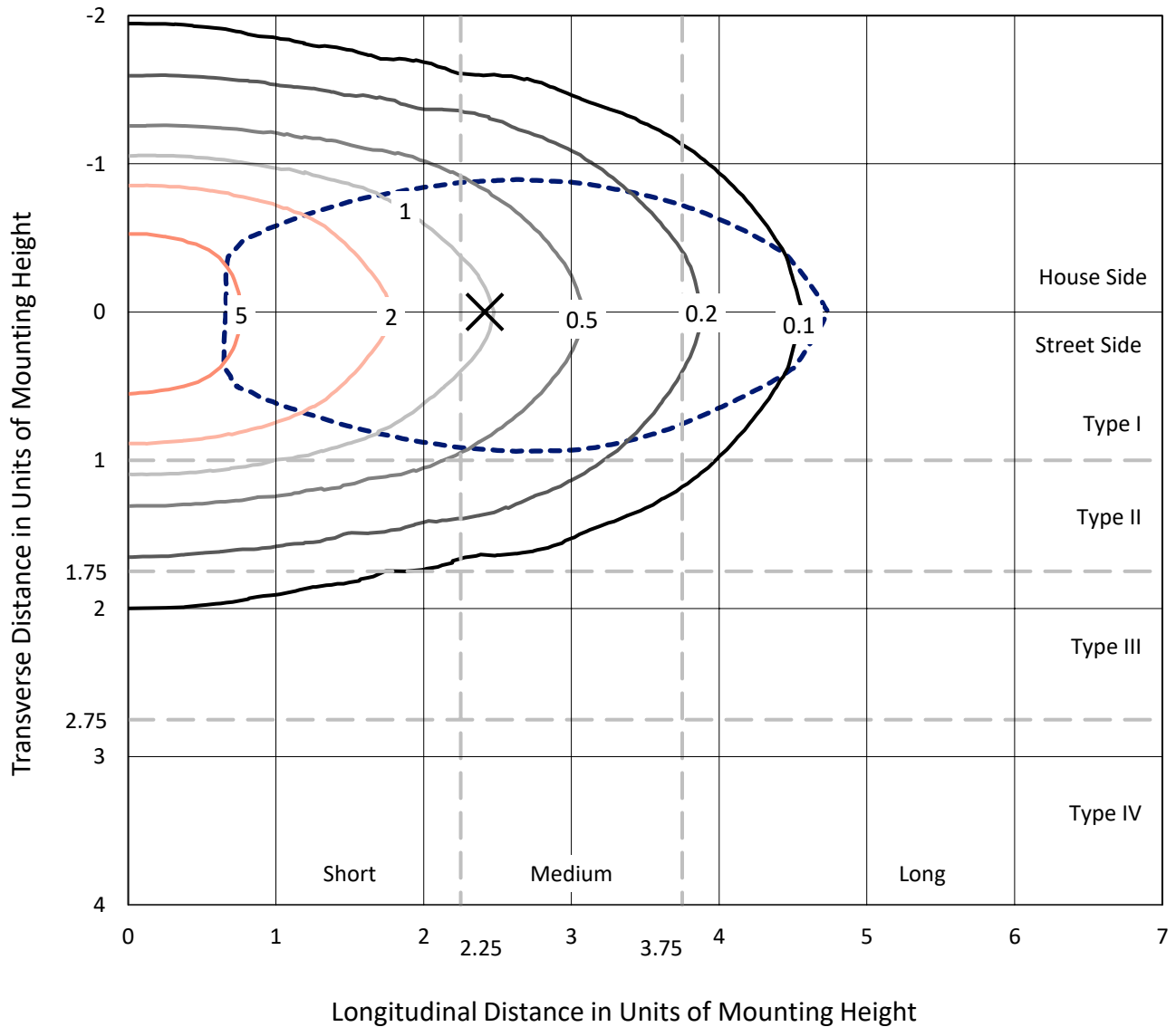
Lumens per Lamp: N/A
Luminaire Lumens: 13332.8 lumens
Efficiency: N/A
Efficacy: 148.1 lumens/watt
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')
IES Classification: Type I - Short
BUG Rating: B3 - U0 - G3

Input Watts (W): 90
Input Voltage (V): 120
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: 0.99
Total Harmonic Distortion (THDi): 6.20%
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

REPORT NUMBER: P868784
 CATALOG NUMBER: EMM2-HSN-SA2B-740-U-T1

Iso-Footcandle Lines of Horizontal Illumination

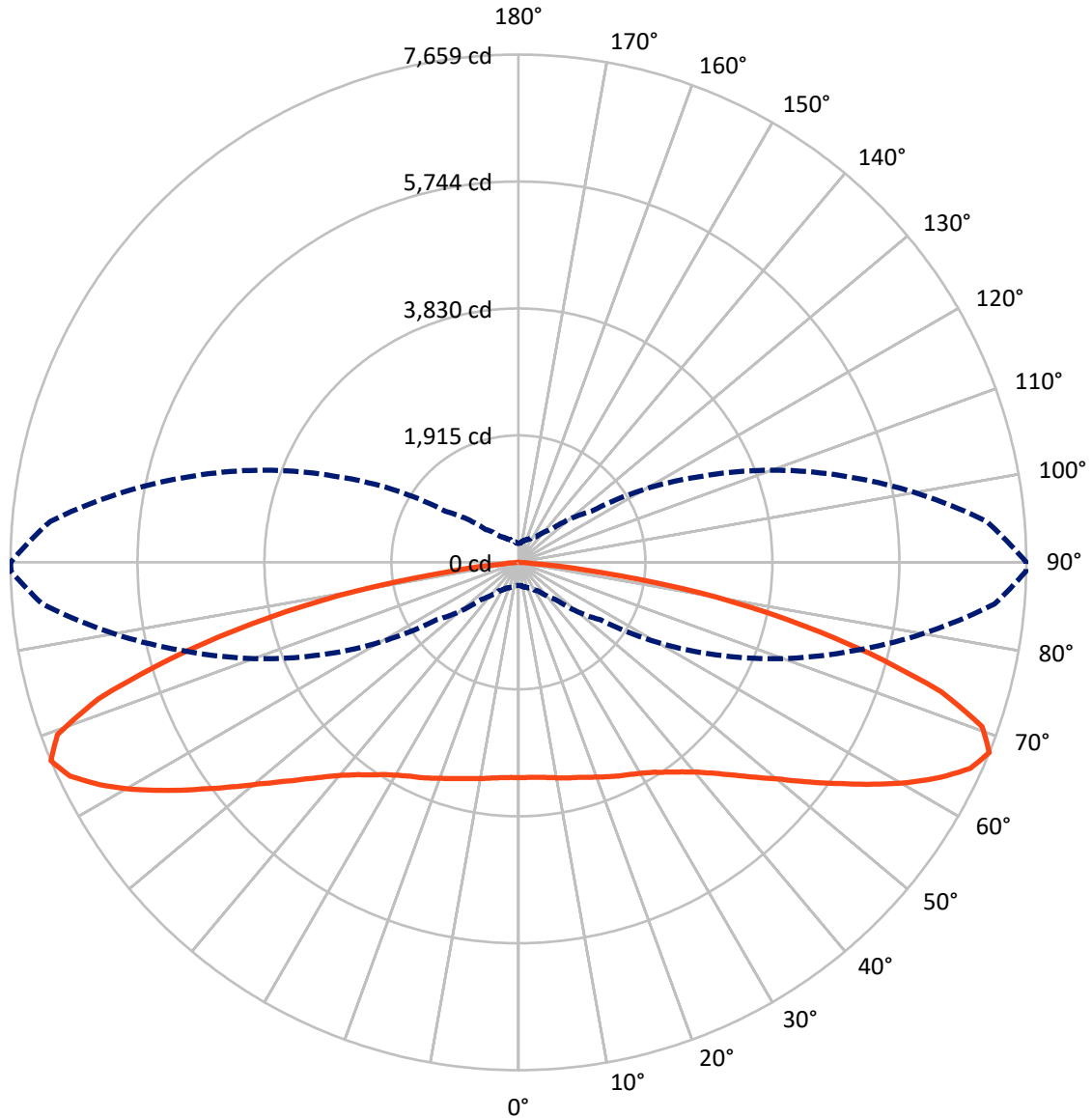
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 8.1 fc
 Type I - Short - N/A

REPORT NUMBER: P868784
CATALOG NUMBER: EMM2-HSN-SA2B-740-U-T1

Luminous Intensity Polar Plot



— Vertical Plane Through 90-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

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FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 6548.0 | 0.0 | 6548.0 |
| | % Fixture | 49.1 | 0.0 | 49.1 |
| Street Side | Lumens | 6784.8 | 0.0 | 6784.8 |
| | % Fixture | 50.9 | 0.0 | 50.9 |
| Total | Lumens | 13332.8 | 0.0 | 13332.8 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

Coefficient of Utilization

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 311.3 | 2.3 |
| 10°-20° | 935.6 | 7.0 |
| 20°-30° | 1548.4 | 11.6 |
| 30°-40° | 2053.1 | 15.4 |
| 40°-50° | 2314.8 | 17.4 |
| 50°-60° | 2373.1 | 17.8 |
| 60°-70° | 2241.3 | 16.8 |
| 70°-80° | 1375.3 | 10.3 |
| 80°-90° | 180.0 | 1.3 |
| 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° | 13332.8 | 100.0 |
| 0°-180° | 13332.8 | 100.0 |



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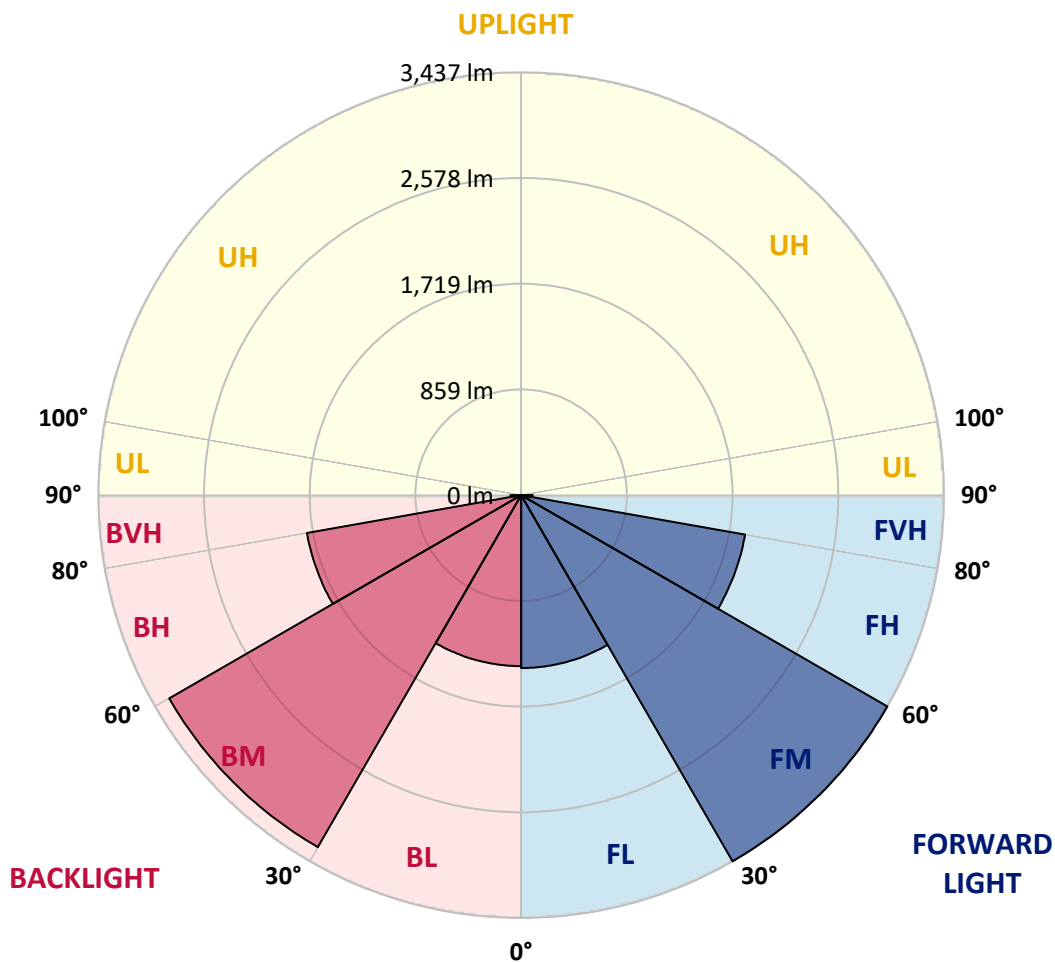
CATALOG NUMBER: EMM2-HSN-SA2B-740-U-T1

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|------|-------------|--------|-----------|-------------------------|------|---------|
| | | | | B | U | G |
| FL | (0°-30°) | 1405.7 | 10.5 | | | |
| FM | (30°-60°) | 3437.0 | 25.8 | | | |
| FH | (60°-80°) | 1848.4 | 13.9 | | | G2/5000 |
| FVH | (80°-90°) | 93.7 | 0.7 | | | G1/100 |
| BL | (0°-30°) | 1389.6 | 10.4 | B3/2500 | | |
| BM | (30°-60°) | 3304.0 | 24.8 | B3/5000 | | |
| BH | (60°-80°) | 1768.2 | 13.3 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 86.2 | 0.6 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B3-U0-G3

Type I Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 85° | 89° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 |
| 2.5° | 3261.3 | 3261.3 | 3253.6 | 3240.8 | 3238.3 | 3240.8 | 3256.2 | 3248.5 | 3248.5 | 3251.1 | 3248.5 |
| 5° | 3261.3 | 3261.3 | 3256.2 | 3243.4 | 3243.4 | 3243.4 | 3261.3 | 3253.6 | 3256.2 | 3258.8 | 3258.8 |
| 7.5° | 3266.4 | 3266.4 | 3261.3 | 3251.1 | 3251.1 | 3251.1 | 3276.7 | 3271.6 | 3271.6 | 3279.2 | 3274.1 |
| 10° | 3279.2 | 3274.1 | 3269.0 | 3271.6 | 3263.9 | 3276.7 | 3289.5 | 3292.0 | 3302.3 | 3307.4 | 3304.8 |
| 12.5° | 3279.2 | 3274.1 | 3261.3 | 3276.7 | 3276.7 | 3294.6 | 3312.5 | 3322.8 | 3335.6 | 3335.6 | 3335.6 |
| 15° | 3263.9 | 3258.8 | 3248.5 | 3274.1 | 3284.4 | 3307.4 | 3333.0 | 3348.4 | 3371.4 | 3371.4 | 3368.8 |
| 17.5° | 3246.0 | 3238.3 | 3233.2 | 3271.6 | 3294.6 | 3325.3 | 3363.7 | 3384.2 | 3409.8 | 3412.3 | 3407.2 |
| 20° | 3212.7 | 3210.1 | 3212.7 | 3263.9 | 3304.8 | 3348.4 | 3394.4 | 3422.6 | 3455.9 | 3466.1 | 3458.4 |
| 22.5° | 3176.8 | 3176.8 | 3187.1 | 3256.2 | 3320.2 | 3379.1 | 3440.5 | 3476.3 | 3509.6 | 3519.9 | 3509.6 |
| 25° | 3128.2 | 3128.2 | 3148.7 | 3230.6 | 3325.3 | 3412.3 | 3484.0 | 3532.7 | 3563.4 | 3573.6 | 3568.5 |
| 27.5° | 3054.0 | 3054.0 | 3077.0 | 3179.4 | 3310.0 | 3437.9 | 3530.1 | 3586.4 | 3619.7 | 3629.9 | 3624.8 |
| 30° | 2949.0 | 2943.9 | 2974.6 | 3102.6 | 3281.8 | 3466.1 | 3583.9 | 3642.7 | 3686.3 | 3693.9 | 3686.3 |
| 32.5° | 2782.6 | 2790.3 | 2836.4 | 2997.6 | 3235.7 | 3484.0 | 3647.9 | 3717.0 | 3765.6 | 3781.0 | 3775.9 |
| 35° | 2580.4 | 2593.2 | 2657.2 | 2864.5 | 3148.7 | 3481.5 | 3714.4 | 3798.9 | 3862.9 | 3883.4 | 3880.8 |
| 37.5° | 2339.8 | 2357.7 | 2437.0 | 2680.2 | 3018.1 | 3443.1 | 3775.9 | 3891.1 | 3975.5 | 4001.1 | 4006.2 |
| 40° | 2076.1 | 2094.0 | 2196.4 | 2465.2 | 2841.5 | 3353.5 | 3811.7 | 3996.0 | 4108.6 | 4159.8 | 4167.5 |
| 42.5° | 1797.1 | 1827.8 | 1950.6 | 2211.8 | 2629.0 | 3210.1 | 3811.7 | 4098.4 | 4236.6 | 4331.4 | 4339.0 |
| 45° | 1528.3 | 1553.9 | 1702.3 | 1958.3 | 2401.2 | 3025.8 | 3768.2 | 4200.8 | 4410.7 | 4574.5 | 4569.4 |
| 47.5° | 1295.3 | 1303.0 | 1438.7 | 1697.2 | 2147.8 | 2815.9 | 3678.6 | 4293.0 | 4595.0 | 4812.6 | 4858.7 |
| 50° | 1054.7 | 1072.6 | 1187.8 | 1443.8 | 1889.2 | 2585.5 | 3527.5 | 4351.8 | 4784.5 | 5114.7 | 5173.6 |
| 52.5° | 885.7 | 888.3 | 975.3 | 1210.8 | 1620.4 | 2306.5 | 3345.8 | 4367.2 | 4966.2 | 5442.4 | 5514.0 |
| 55° | 721.9 | 734.7 | 808.9 | 985.6 | 1361.9 | 2032.6 | 3110.3 | 4344.2 | 5132.6 | 5759.8 | 5892.9 |
| 57.5° | 619.5 | 622.1 | 675.8 | 816.6 | 1149.4 | 1740.7 | 2849.2 | 4267.4 | 5270.8 | 6110.5 | 6279.4 |
| 60° | 532.5 | 532.5 | 573.4 | 680.9 | 929.2 | 1456.6 | 2542.0 | 4131.7 | 5347.6 | 6486.8 | 6732.5 |
| 62.5° | 463.3 | 465.9 | 501.7 | 581.1 | 773.1 | 1203.2 | 2204.1 | 3919.2 | 5375.8 | 6850.3 | 7131.9 |
| 65° | 419.8 | 422.4 | 442.9 | 496.6 | 637.4 | 977.9 | 1858.5 | 3660.7 | 5337.4 | 7121.6 | 7487.7 |
| 67.5° | 348.1 | 350.7 | 386.5 | 427.5 | 529.9 | 785.9 | 1510.3 | 3302.3 | 5181.2 | 7206.1 | 7654.1 |
| 70° | 266.2 | 273.9 | 322.5 | 366.1 | 440.3 | 627.2 | 1159.6 | 2828.7 | 4807.5 | 6919.4 | 7380.2 |
| 72.5° | 222.7 | 225.3 | 261.1 | 309.7 | 368.6 | 491.5 | 880.6 | 2227.1 | 4239.2 | 6179.6 | 6691.6 |
| 75° | 194.6 | 197.1 | 217.6 | 261.1 | 307.2 | 394.2 | 611.8 | 1538.5 | 3381.6 | 4996.9 | 5465.4 |
| 77.5° | 176.6 | 179.2 | 184.3 | 220.2 | 258.6 | 304.6 | 432.6 | 913.9 | 2385.8 | 3819.4 | 4065.1 |
| 80° | 169.0 | 169.0 | 156.2 | 181.8 | 212.5 | 238.1 | 289.3 | 524.8 | 1530.8 | 2575.3 | 2772.4 |
| 82.5° | 120.3 | 117.8 | 107.5 | 112.6 | 130.6 | 130.6 | 148.5 | 217.6 | 586.2 | 1088.0 | 1180.1 |
| 85° | 7.7 | 7.7 | 12.8 | 15.4 | 23.0 | 30.7 | 38.4 | 51.2 | 148.5 | 202.2 | 209.9 |
| 87.5° | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 5.1 | 5.1 | 5.1 | 7.7 | 10.2 | 10.2 |
| 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: P868784

CATALOG NUMBER: EMM2-HSN-SA2B-740-U-T1

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 | 3248.5 |
| 2.5° | 3246.0 | 3248.5 | 3248.5 | 3253.6 | 3258.8 | 3256.2 | 3253.6 | 3258.8 | 3251.1 | 3235.7 | 3233.2 |
| 5° | 3256.2 | 3256.2 | 3253.6 | 3258.8 | 3263.9 | 3258.8 | 3253.6 | 3253.6 | 3248.5 | 3233.2 | 3230.6 |
| 7.5° | 3276.7 | 3274.1 | 3274.1 | 3274.1 | 3274.1 | 3266.4 | 3258.8 | 3253.6 | 3246.0 | 3230.6 | 3222.9 |
| 10° | 3304.8 | 3302.3 | 3299.7 | 3297.2 | 3284.4 | 3276.7 | 3263.9 | 3256.2 | 3246.0 | 3228.0 | 3222.9 |
| 12.5° | 3335.6 | 3330.4 | 3325.3 | 3327.9 | 3302.3 | 3279.2 | 3266.4 | 3248.5 | 3240.8 | 3199.9 | 3192.2 |
| 15° | 3366.3 | 3358.6 | 3356.0 | 3345.8 | 3320.2 | 3286.9 | 3261.3 | 3235.7 | 3210.1 | 3171.7 | 3158.9 |
| 17.5° | 3407.2 | 3402.1 | 3386.7 | 3376.5 | 3340.7 | 3294.6 | 3256.2 | 3220.4 | 3187.1 | 3141.0 | 3133.3 |
| 20° | 3455.9 | 3450.7 | 3435.4 | 3414.9 | 3368.8 | 3312.5 | 3258.8 | 3202.4 | 3161.5 | 3107.7 | 3094.9 |
| 22.5° | 3509.6 | 3501.9 | 3489.1 | 3466.1 | 3407.2 | 3340.7 | 3266.4 | 3192.2 | 3130.8 | 3069.3 | 3061.6 |
| 25° | 3565.9 | 3560.8 | 3548.0 | 3514.7 | 3450.7 | 3368.8 | 3266.4 | 3156.4 | 3079.6 | 3025.8 | 3002.8 |
| 27.5° | 3619.7 | 3617.1 | 3601.8 | 3563.4 | 3496.8 | 3389.3 | 3243.4 | 3097.5 | 2995.1 | 2923.4 | 2908.0 |
| 30° | 3688.8 | 3683.7 | 3665.8 | 3622.3 | 3548.0 | 3402.1 | 3197.3 | 2997.6 | 2869.6 | 2790.3 | 2767.3 |
| 32.5° | 3773.3 | 3768.2 | 3742.6 | 3688.8 | 3609.5 | 3404.7 | 3130.8 | 2869.6 | 2700.7 | 2616.2 | 2588.1 |
| 35° | 3885.9 | 3875.7 | 3842.4 | 3778.4 | 3668.3 | 3379.1 | 3013.0 | 2705.8 | 2498.5 | 2388.4 | 2350.0 |
| 37.5° | 4008.8 | 3996.0 | 3952.5 | 3873.1 | 3709.3 | 3310.0 | 2846.6 | 2485.7 | 2250.2 | 2119.6 | 2091.4 |
| 40° | 4159.8 | 4141.9 | 4075.4 | 3965.3 | 3724.7 | 3189.6 | 2659.7 | 2260.4 | 2009.5 | 1866.2 | 1832.9 |
| 42.5° | 4349.3 | 4318.6 | 4211.0 | 4067.7 | 3693.9 | 3025.8 | 2437.0 | 2027.4 | 1740.7 | 1607.6 | 1599.9 |
| 45° | 4577.1 | 4528.5 | 4367.2 | 4167.5 | 3627.4 | 2821.0 | 2201.5 | 1766.3 | 1492.4 | 1361.9 | 1328.6 |
| 47.5° | 4845.9 | 4787.0 | 4548.9 | 4244.3 | 3496.8 | 2611.1 | 1948.1 | 1512.9 | 1262.0 | 1128.9 | 1103.3 |
| 50° | 5142.8 | 5086.5 | 4740.9 | 4287.8 | 3356.0 | 2365.3 | 1699.8 | 1287.6 | 1036.8 | 926.7 | 926.7 |
| 52.5° | 5503.8 | 5375.8 | 4925.3 | 4293.0 | 3141.0 | 2094.0 | 1461.7 | 1067.5 | 870.4 | 773.1 | 752.6 |
| 55° | 5887.8 | 5736.7 | 5091.6 | 4246.9 | 2918.3 | 1845.7 | 1205.7 | 888.3 | 714.2 | 645.1 | 627.2 |
| 57.5° | 6315.3 | 6084.9 | 5212.0 | 4154.7 | 2636.7 | 1574.3 | 1006.0 | 732.1 | 601.6 | 545.3 | 537.6 |
| 60° | 6745.3 | 6448.4 | 5283.6 | 3998.6 | 2337.2 | 1323.5 | 837.1 | 611.8 | 517.1 | 476.1 | 468.5 |
| 62.5° | 7144.7 | 6745.3 | 5288.8 | 3770.7 | 2045.4 | 1103.3 | 686.1 | 527.3 | 458.2 | 427.5 | 427.5 |
| 65° | 7490.3 | 6993.7 | 5201.7 | 3478.9 | 1674.2 | 885.7 | 565.7 | 445.4 | 399.3 | 366.1 | 358.4 |
| 67.5° | 7659.2 | 7088.4 | 5048.1 | 3079.6 | 1341.4 | 701.4 | 476.1 | 386.5 | 343.0 | 291.8 | 286.7 |
| 70° | 7421.2 | 6814.5 | 4653.9 | 2567.6 | 1036.8 | 558.1 | 396.8 | 330.2 | 286.7 | 243.2 | 238.1 |
| 72.5° | 6660.9 | 6084.9 | 4016.5 | 1989.0 | 780.8 | 450.5 | 330.2 | 281.6 | 235.5 | 212.5 | 207.4 |
| 75° | 5450.0 | 5060.9 | 3174.3 | 1369.5 | 545.3 | 353.3 | 276.5 | 238.1 | 199.7 | 189.4 | 186.9 |
| 77.5° | 4136.8 | 3763.1 | 2319.3 | 857.6 | 373.7 | 276.5 | 235.5 | 202.2 | 174.1 | 181.8 | 176.6 |
| 80° | 2762.1 | 2590.6 | 1541.1 | 486.4 | 250.9 | 202.2 | 179.2 | 148.5 | 133.1 | 153.6 | 148.5 |
| 82.5° | 1254.4 | 1187.8 | 724.5 | 212.5 | 112.6 | 87.0 | 61.4 | 46.1 | 35.8 | 33.3 | 38.4 |
| 85° | 209.9 | 184.3 | 51.2 | 23.0 | 12.8 | 7.7 | 5.1 | 5.1 | 2.6 | 2.6 | 2.6 |
| 87.5° | 10.2 | 7.7 | 7.7 | 5.1 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 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 |

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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-157-5

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-740-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-740-U-5WQ-2

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-5
 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-40-740-U-5WQ-2**
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

Spectral Parameters

CCT (K): 3915
 CIE u': 0.2262
 CIE v': 0.5044
 Duv: 0.0010
 CIE x: 0.3850
 CIE y: 0.3816
 CIE z: 0.2334
 Peak Wavelength (nm): 449
 Dominant Wavelength (nm): 578
 Purity: 30.05482
 R_f: 73.2
 R_g: 93.9

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.0 | | |
| R1: | 67.6 | R9: | -38.4 |
| R2: | 78.3 | R10: | 48.9 |
| R3: | 87.1 | R11: | 65.3 |
| R4: | 69.7 | R12: | 40.4 |
| R5: | 67.4 | R13: | 69.3 |
| R6: | 69.3 | R14: | 92.6 |
| R7: | 79.7 | R15: | 59.9 |
| R8: | 48.7 | | |



Test Conditions

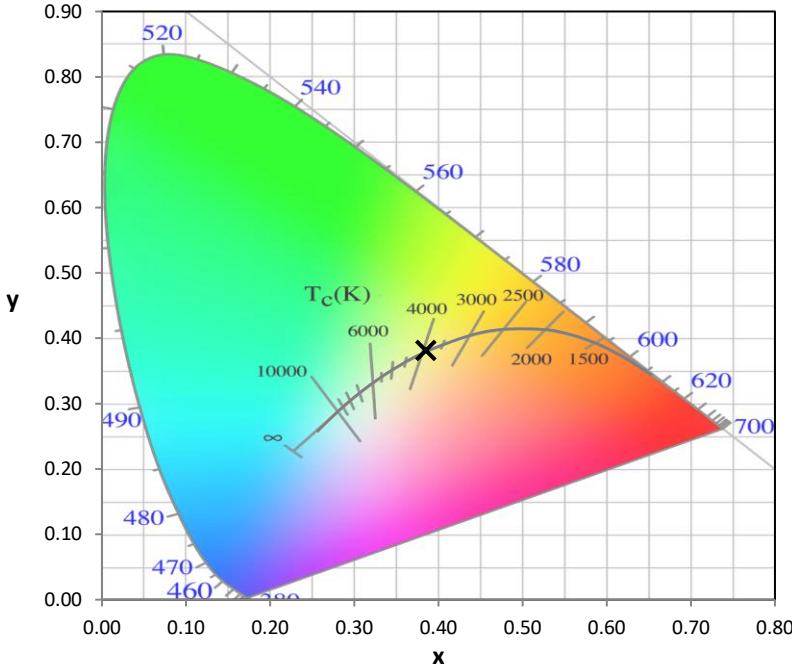
Stabilization Time: 21M
 Operation Time: 1H 21M
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2407-157-5

| 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: SP1-2407-157-5

CIE 1931 Chromaticity Diagram



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



CCT = 3915K
 CIE x = 0.3850
 CIE y = 0.3816
 Duv = 0.0010

Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2407-157-5

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 | 112 | NR | 620 | 618 | NR | 750 | 15 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 153 | NR | 625 | 563 | NR | 755 | 13 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 216 | NR | 630 | 510 | NR | 760 | 11 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 291 | NR | 635 | 456 | NR | 765 | 9 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 366 | NR | 640 | 407 | NR | 770 | 8 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 436 | NR | 645 | 359 | NR | 775 | 7 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 492 | NR | 650 | 316 | NR | 780 | 6 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 536 | NR | 655 | 277 | NR | 785 | 5 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 567 | NR | 660 | 240 | NR | 790 | 4 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 596 | NR | 665 | 208 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 619 | NR | 670 | 179 | NR | 800 | 3 | NR | 930 | 0 | NR |
| 415 | 25 | NR | 545 | 644 | NR | 675 | 154 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 51 | NR | 550 | 671 | NR | 680 | 133 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 100 | NR | 555 | 701 | NR | 685 | 114 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 180 | NR | 560 | 735 | NR | 690 | 98 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 315 | NR | 565 | 768 | NR | 695 | 83 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 514 | NR | 570 | 798 | NR | 700 | 71 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 828 | NR | 575 | 825 | NR | 705 | 61 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 992 | NR | 580 | 843 | NR | 710 | 52 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 652 | NR | 585 | 848 | NR | 715 | 44 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 382 | NR | 590 | 844 | NR | 720 | 38 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 282 | NR | 595 | 826 | NR | 725 | 32 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 180 | NR | 600 | 800 | NR | 730 | 28 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 119 | NR | 605 | 762 | NR | 735 | 24 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 101 | NR | 610 | 719 | NR | 740 | 20 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 98 | NR | 615 | 669 | NR | 745 | 17 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2407-157-5

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.49

| 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 | 112 | NR | 620 | 618 | NR | 750 | 15 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 153 | NR | 625 | 563 | NR | 755 | 13 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 216 | NR | 630 | 510 | NR | 760 | 11 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 291 | NR | 635 | 456 | NR | 765 | 9 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 366 | NR | 640 | 407 | NR | 770 | 8 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 436 | NR | 645 | 359 | NR | 775 | 7 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 492 | NR | 650 | 316 | NR | 780 | 6 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 536 | NR | 655 | 277 | NR | 785 | 5 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 567 | NR | 660 | 240 | NR | 790 | 4 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 596 | NR | 665 | 208 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 619 | NR | 670 | 179 | NR | 800 | 3 | NR | 930 | 0 | NR |
| 415 | 25 | NR | 545 | 644 | NR | 675 | 154 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 51 | NR | 550 | 671 | NR | 680 | 133 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 100 | NR | 555 | 701 | NR | 685 | 114 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 180 | NR | 560 | 735 | NR | 690 | 98 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 315 | NR | 565 | 768 | NR | 695 | 83 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 514 | NR | 570 | 798 | NR | 700 | 71 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 828 | NR | 575 | 825 | NR | 705 | 61 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 992 | NR | 580 | 843 | NR | 710 | 52 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 652 | NR | 585 | 848 | NR | 715 | 44 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 382 | NR | 590 | 844 | NR | 720 | 38 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 282 | NR | 595 | 826 | NR | 725 | 32 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 180 | NR | 600 | 800 | NR | 730 | 28 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 119 | NR | 605 | 762 | NR | 735 | 24 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 101 | NR | 610 | 719 | NR | 740 | 20 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 98 | NR | 615 | 669 | NR | 745 | 17 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2407-157-5

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.88

| 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 | 112 | NR | 620 | 618 | NR | 750 | 15 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 153 | NR | 625 | 563 | NR | 755 | 13 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 216 | NR | 630 | 510 | NR | 760 | 11 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 291 | NR | 635 | 456 | NR | 765 | 9 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 366 | NR | 640 | 407 | NR | 770 | 8 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 436 | NR | 645 | 359 | NR | 775 | 7 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 492 | NR | 650 | 316 | NR | 780 | 6 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 536 | NR | 655 | 277 | NR | 785 | 5 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 567 | NR | 660 | 240 | NR | 790 | 4 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 596 | NR | 665 | 208 | NR | 795 | 4 | NR | 925 | 0 | NR |
| 410 | 12 | NR | 540 | 619 | NR | 670 | 179 | NR | 800 | 3 | NR | 930 | 0 | NR |
| 415 | 25 | NR | 545 | 644 | NR | 675 | 154 | NR | 805 | 3 | NR | 935 | 0 | NR |
| 420 | 51 | NR | 550 | 671 | NR | 680 | 133 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 100 | NR | 555 | 701 | NR | 685 | 114 | NR | 815 | 2 | NR | 945 | 0 | NR |
| 430 | 180 | NR | 560 | 735 | NR | 690 | 98 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 315 | NR | 565 | 768 | NR | 695 | 83 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 514 | NR | 570 | 798 | NR | 700 | 71 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 828 | NR | 575 | 825 | NR | 705 | 61 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 992 | NR | 580 | 843 | NR | 710 | 52 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 652 | NR | 585 | 848 | NR | 715 | 44 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 382 | NR | 590 | 844 | NR | 720 | 38 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 282 | NR | 595 | 826 | NR | 725 | 32 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 180 | NR | 600 | 800 | NR | 730 | 28 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 119 | NR | 605 | 762 | NR | 735 | 24 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 101 | NR | 610 | 719 | NR | 740 | 20 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 98 | NR | 615 | 669 | NR | 745 | 17 | NR | 875 | 0 | NR | | | |

Summary

$R_f = 73.2$
 $R_g = 93.9$
 $CIE R_a = 71.0$
 $R_g = -38.4$



Color Vector Graphics



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

| | | | |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 88 | CES76 = 50 |
| CES02 = 61 | CES27 = 88 | CES52 = 87 | CES77 = 69 |
| CES03 = 30 | CES28 = 81 | CES53 = 77 | CES78 = 53 |
| CES04 = 70 | CES29 = 65 | CES54 = 84 | CES79 = 81 |
| CES05 = 47 | CES30 = 81 | CES55 = 83 | CES80 = 78 |
| CES06 = 50 | CES31 = 69 | CES56 = 73 | CES81 = 77 |
| CES07 = 40 | CES32 = 60 | CES57 = 72 | CES82 = 91 |
| CES08 = 39 | CES33 = 76 | CES58 = 73 | CES83 = 89 |
| CES09 = 29 | CES34 = 70 | CES59 = 85 | CES84 = 86 |
| CES10 = 74 | CES35 = 83 | CES60 = 89 | CES85 = 77 |
| CES11 = 57 | CES36 = 91 | CES61 = 81 | CES86 = 71 |
| CES12 = 63 | CES37 = 79 | CES62 = 85 | CES87 = 76 |
| CES13 = 42 | CES38 = 92 | CES63 = 72 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 64 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 61 | CES90 = 79 |
| CES16 = 46 | CES41 = 93 | CES66 = 57 | CES91 = 74 |
| CES17 = 49 | CES42 = 80 | CES67 = 54 | CES92 = 57 |
| CES18 = 56 | CES43 = 76 | CES68 = 63 | CES93 = 74 |
| CES19 = 72 | CES44 = 99 | CES69 = 73 | CES94 = 51 |
| CES20 = 65 | CES45 = 85 | CES70 = 55 | CES95 = 65 |
| CES21 = 86 | CES46 = 82 | CES71 = 48 | CES96 = 76 |
| CES22 = 78 | CES47 = 86 | CES72 = 83 | CES97 = 84 |
| CES23 = 92 | CES48 = 77 | CES73 = 45 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 93 | CES99 = 62 |
| CES25 = 72 | CES50 = 88 | CES75 = 51 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)