

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: P868770

Luminaire Tested: **EMM2-HSN-SA2B-727-U-T1**

Issue Date: 08/22/2024



Test Information

Test Method: LM-79-08
Report Number: P868770
Test Lab: INNOVATION CENTER(G3)
Issue Date: 08/22/2024
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: INVUE
Catalog Number: EMM2-HSN-SA2B-727-U-T1
Description: EPIC MODERN SHORT HOUSING DISCRETE LED ARRAYS 100W 70CRI 2700K
FITXURE w/ TYPE 1 DISTRIBUTION OPTIC
Light Source: (20) 2700K CCT, 70 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER

Summary

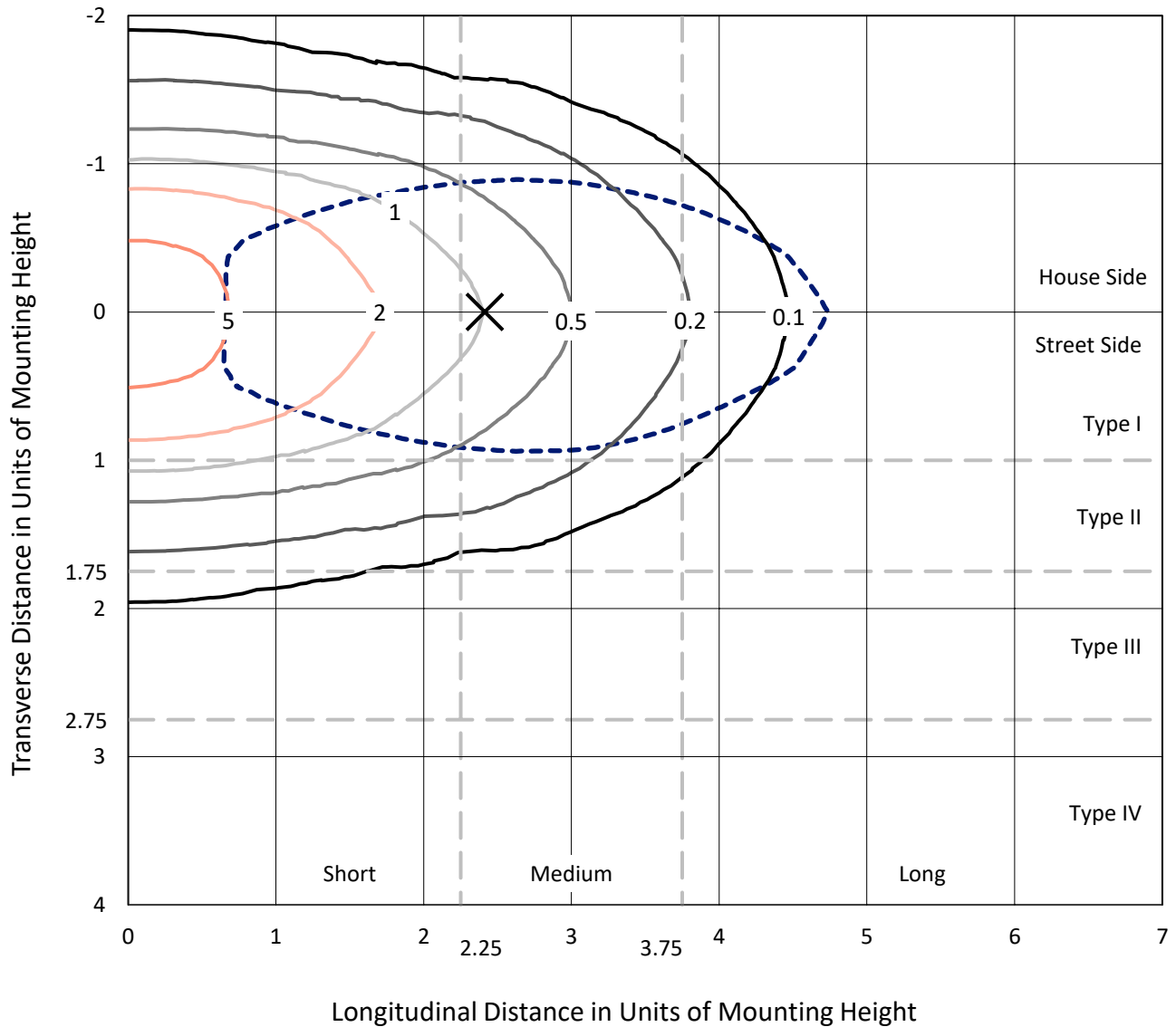
Lumens per Lamp: N/A
Luminaire Lumens: 12307.5 lumens
Efficiency: N/A
Efficacy: 136.8 lumens/watt
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')
IES Classification: Type I - Short
BUG Rating: B3 - U0 - G3

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

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Iso-Footcandle Lines of Horizontal Illumination

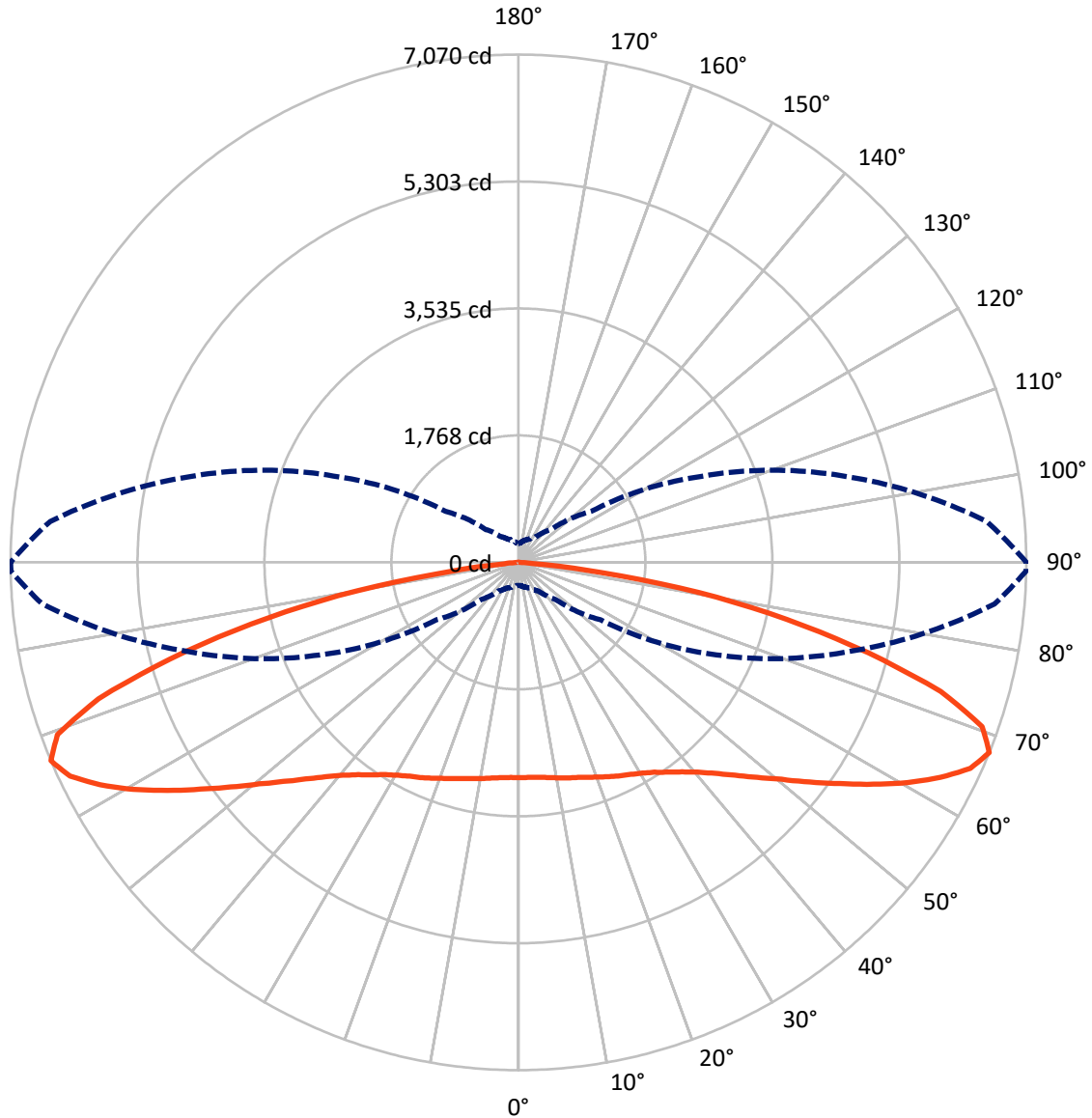
× Max cd
 - - - 1/2 Max cd



Based on 20 foot mounting height. Maximum calculated value = 7.5 fc
 Type I - Short - N/A

REPORT NUMBER: P868770
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Luminous Intensity Polar Plot



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

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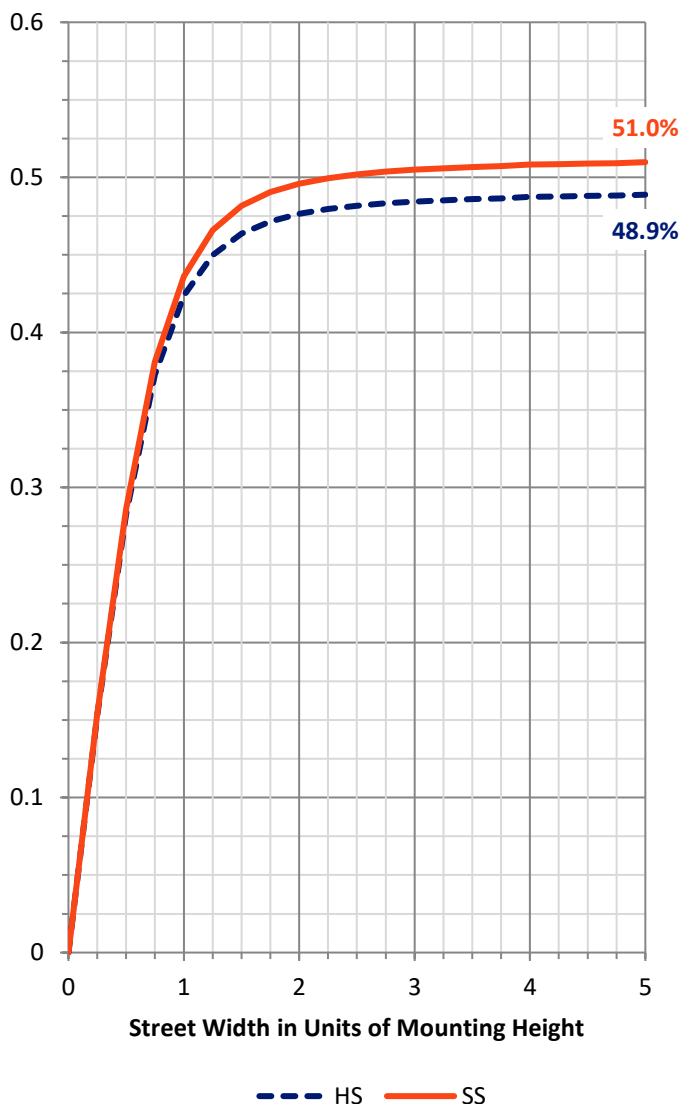
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 6044.5 | 0.0 | 6044.5 |
| | % Fixture | 49.1 | 0.0 | 49.1 |
| Street Side | Lumens | 6263.1 | 0.0 | 6263.1 |
| | % Fixture | 50.9 | 0.0 | 50.9 |
| Total | Lumens | 12307.5 | 0.0 | 12307.5 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 287.4 | 2.3 |
| 10°-20° | 863.6 | 7.0 |
| 20°-30° | 1429.3 | 11.6 |
| 30°-40° | 1895.2 | 15.4 |
| 40°-50° | 2136.8 | 17.4 |
| 50°-60° | 2190.6 | 17.8 |
| 60°-70° | 2069.0 | 16.8 |
| 70°-80° | 1269.5 | 10.3 |
| 80°-90° | 166.1 | 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° | 12307.5 | 100.0 |
| 0°-180° | 12307.5 | 100.0 |

Coefficient of Utilization



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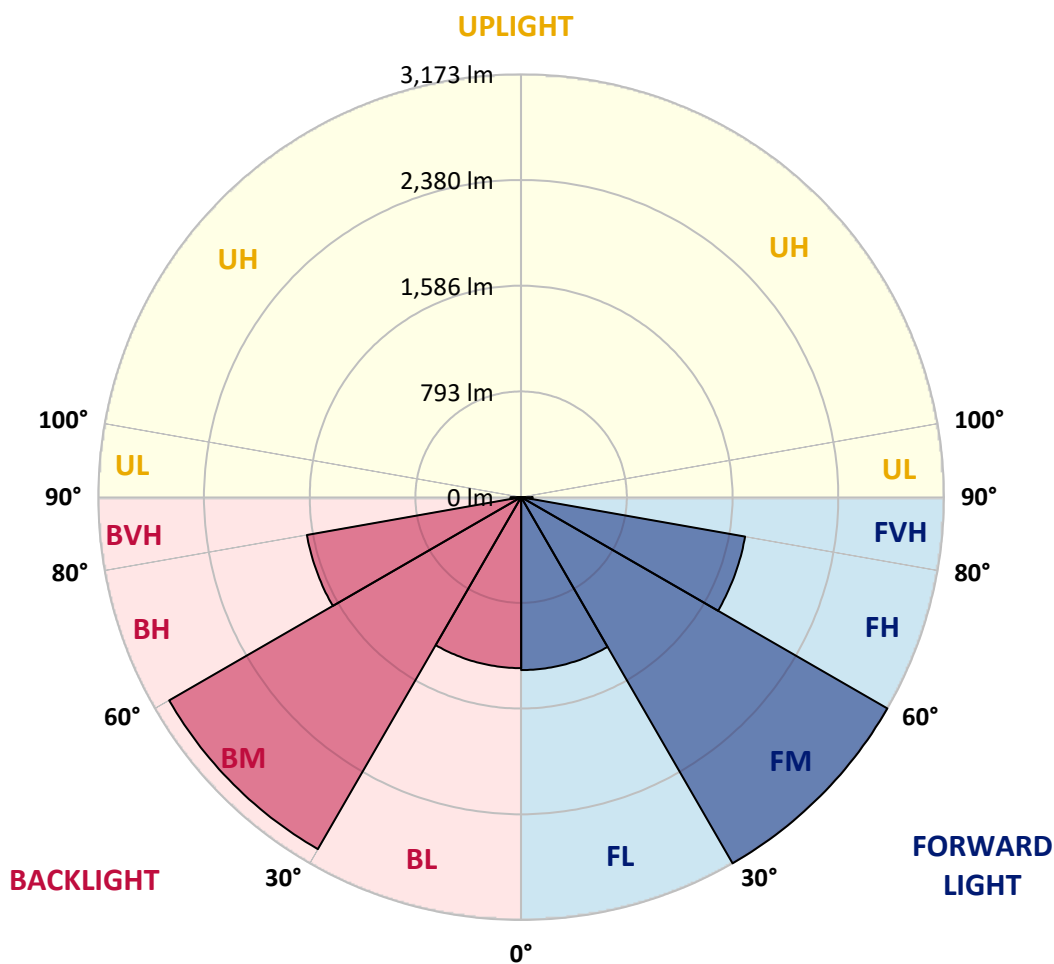
CATALOG NUMBER: EMM2-HSN-SA2B-727-U-T1

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|------|-------------|--------|-----------|-------------------------|------|---------|
| | | | | B | U | G |
| FL | (0°-30°) | 1297.6 | 10.5 | | | |
| FM | (30°-60°) | 3172.7 | 25.8 | | | |
| FH | (60°-80°) | 1706.2 | 13.9 | | | G1/1800 |
| FVH | (80°-90°) | 86.5 | 0.7 | | | G1/100 |
| BL | (0°-30°) | 1282.8 | 10.4 | B3/2500 | | |
| BM | (30°-60°) | 3049.9 | 24.8 | B3/5000 | | |
| BH | (60°-80°) | 1632.2 | 13.3 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 79.6 | 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° | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 |
| 2.5° | 3010.5 | 3010.5 | 3003.4 | 2991.6 | 2989.3 | 2991.6 | 3005.8 | 2998.7 | 2998.7 | 3001.1 | 2998.7 |
| 5° | 3010.5 | 3010.5 | 3005.8 | 2994.0 | 2994.0 | 2994.0 | 3010.5 | 3003.4 | 3005.8 | 3008.2 | 3008.2 |
| 7.5° | 3015.2 | 3015.2 | 3010.5 | 3001.1 | 3001.1 | 3001.1 | 3024.7 | 3020.0 | 3020.0 | 3027.1 | 3022.3 |
| 10° | 3027.1 | 3022.3 | 3017.6 | 3020.0 | 3012.9 | 3024.7 | 3036.5 | 3038.9 | 3048.3 | 3053.1 | 3050.7 |
| 12.5° | 3027.1 | 3022.3 | 3010.5 | 3024.7 | 3024.7 | 3041.2 | 3057.8 | 3067.2 | 3079.0 | 3079.0 | 3079.0 |
| 15° | 3012.9 | 3008.2 | 2998.7 | 3022.3 | 3031.8 | 3053.1 | 3076.7 | 3090.9 | 3112.1 | 3112.1 | 3109.8 |
| 17.5° | 2996.3 | 2989.3 | 2984.5 | 3020.0 | 3041.2 | 3069.6 | 3105.0 | 3123.9 | 3147.6 | 3149.9 | 3145.2 |
| 20° | 2965.6 | 2963.3 | 2965.6 | 3012.9 | 3050.7 | 3090.9 | 3133.4 | 3159.4 | 3190.1 | 3199.6 | 3192.5 |
| 22.5° | 2932.5 | 2932.5 | 2942.0 | 3005.8 | 3064.9 | 3119.2 | 3175.9 | 3209.0 | 3239.7 | 3249.2 | 3239.7 |
| 25° | 2887.6 | 2887.6 | 2906.5 | 2982.2 | 3069.6 | 3149.9 | 3216.1 | 3261.0 | 3289.4 | 3298.8 | 3294.1 |
| 27.5° | 2819.1 | 2819.1 | 2840.4 | 2934.9 | 3055.4 | 3173.6 | 3258.6 | 3310.6 | 3341.3 | 3350.8 | 3346.1 |
| 30° | 2722.2 | 2717.5 | 2745.9 | 2864.0 | 3029.4 | 3199.6 | 3308.3 | 3362.6 | 3402.8 | 3409.9 | 3402.8 |
| 32.5° | 2568.6 | 2575.7 | 2618.3 | 2767.1 | 2986.9 | 3216.1 | 3367.3 | 3431.1 | 3476.0 | 3490.2 | 3485.5 |
| 35° | 2381.9 | 2393.8 | 2452.8 | 2644.2 | 2906.5 | 3213.7 | 3428.8 | 3506.8 | 3565.8 | 3584.7 | 3582.4 |
| 37.5° | 2159.8 | 2176.4 | 2249.6 | 2474.1 | 2786.0 | 3178.3 | 3485.5 | 3591.8 | 3669.8 | 3693.4 | 3698.2 |
| 40° | 1916.4 | 1933.0 | 2027.5 | 2275.6 | 2623.0 | 3095.6 | 3518.6 | 3688.7 | 3792.7 | 3839.9 | 3847.0 |
| 42.5° | 1658.9 | 1687.2 | 1800.6 | 2041.7 | 2426.8 | 2963.3 | 3518.6 | 3783.2 | 3910.8 | 3998.3 | 4005.4 |
| 45° | 1410.7 | 1434.4 | 1571.4 | 1807.7 | 2216.5 | 2793.1 | 3478.4 | 3877.8 | 4071.5 | 4222.8 | 4218.0 |
| 47.5° | 1195.7 | 1202.8 | 1328.0 | 1566.7 | 1982.6 | 2599.3 | 3395.7 | 3962.8 | 4241.7 | 4442.5 | 4485.1 |
| 50° | 973.6 | 990.1 | 1096.5 | 1332.8 | 1743.9 | 2386.7 | 3256.3 | 4017.2 | 4416.5 | 4721.4 | 4775.7 |
| 52.5° | 817.6 | 820.0 | 900.3 | 1117.7 | 1495.8 | 2129.1 | 3088.5 | 4031.4 | 4584.3 | 5023.8 | 5090.0 |
| 55° | 666.4 | 678.2 | 746.7 | 909.8 | 1257.1 | 1876.3 | 2871.1 | 4010.1 | 4737.9 | 5316.9 | 5439.7 |
| 57.5° | 571.9 | 574.2 | 623.8 | 753.8 | 1061.0 | 1606.9 | 2630.1 | 3939.2 | 4865.5 | 5640.6 | 5796.5 |
| 60° | 491.5 | 491.5 | 529.3 | 628.6 | 857.8 | 1344.6 | 2346.5 | 3814.0 | 4936.4 | 5988.0 | 6214.8 |
| 62.5° | 427.7 | 430.1 | 463.2 | 536.4 | 713.6 | 1110.6 | 2034.6 | 3617.8 | 4962.4 | 6323.5 | 6583.4 |
| 65° | 387.5 | 389.9 | 408.8 | 458.4 | 588.4 | 902.7 | 1715.6 | 3379.2 | 4926.9 | 6574.0 | 6911.9 |
| 67.5° | 321.4 | 323.7 | 356.8 | 394.6 | 489.2 | 725.5 | 1394.2 | 3048.3 | 4782.8 | 6652.0 | 7065.5 |
| 70° | 245.8 | 252.8 | 297.7 | 337.9 | 406.4 | 578.9 | 1070.5 | 2611.2 | 4437.8 | 6387.3 | 6812.7 |
| 72.5° | 205.6 | 207.9 | 241.0 | 285.9 | 340.3 | 453.7 | 812.9 | 2055.8 | 3913.2 | 5704.4 | 6177.0 |
| 75° | 179.6 | 182.0 | 200.9 | 241.0 | 283.6 | 363.9 | 564.8 | 1420.2 | 3121.6 | 4612.7 | 5045.1 |
| 77.5° | 163.1 | 165.4 | 170.1 | 203.2 | 238.7 | 281.2 | 399.4 | 843.6 | 2202.4 | 3525.7 | 3752.5 |
| 80° | 156.0 | 156.0 | 144.1 | 167.8 | 196.1 | 219.8 | 267.0 | 484.4 | 1413.1 | 2377.2 | 2559.2 |
| 82.5° | 111.1 | 108.7 | 99.2 | 104.0 | 120.5 | 120.5 | 137.1 | 200.9 | 541.1 | 1004.3 | 1089.4 |
| 85° | 7.1 | 7.1 | 11.8 | 14.2 | 21.3 | 28.4 | 35.4 | 47.3 | 137.1 | 186.7 | 193.8 |
| 87.5° | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 4.7 | 4.7 | 4.7 | 7.1 | 9.5 | 9.5 |
| 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: P868770
 CATALOG NUMBER: EMM2-HSN-SA2B-727-U-T1

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 | 2998.7 |
| 2.5° | 2996.3 | 2998.7 | 2998.7 | 3003.4 | 3008.2 | 3005.8 | 3003.4 | 3008.2 | 3001.1 | 2986.9 | 2984.5 |
| 5° | 3005.8 | 3005.8 | 3003.4 | 3008.2 | 3012.9 | 3008.2 | 3003.4 | 3003.4 | 2998.7 | 2984.5 | 2982.2 |
| 7.5° | 3024.7 | 3022.3 | 3022.3 | 3022.3 | 3022.3 | 3015.2 | 3008.2 | 3003.4 | 2996.3 | 2982.2 | 2975.1 |
| 10° | 3050.7 | 3048.3 | 3046.0 | 3043.6 | 3031.8 | 3024.7 | 3012.9 | 3005.8 | 2996.3 | 2979.8 | 2975.1 |
| 12.5° | 3079.0 | 3074.3 | 3069.6 | 3072.0 | 3048.3 | 3027.1 | 3015.2 | 2998.7 | 2991.6 | 2953.8 | 2946.7 |
| 15° | 3107.4 | 3100.3 | 3098.0 | 3088.5 | 3064.9 | 3034.2 | 3010.5 | 2986.9 | 2963.3 | 2927.8 | 2916.0 |
| 17.5° | 3145.2 | 3140.5 | 3126.3 | 3116.9 | 3083.8 | 3041.2 | 3005.8 | 2972.7 | 2942.0 | 2899.5 | 2892.4 |
| 20° | 3190.1 | 3185.4 | 3171.2 | 3152.3 | 3109.8 | 3057.8 | 3008.2 | 2956.2 | 2918.4 | 2868.7 | 2856.9 |
| 22.5° | 3239.7 | 3232.6 | 3220.8 | 3199.6 | 3145.2 | 3083.8 | 3015.2 | 2946.7 | 2890.0 | 2833.3 | 2826.2 |
| 25° | 3291.7 | 3287.0 | 3275.2 | 3244.5 | 3185.4 | 3109.8 | 3015.2 | 2913.6 | 2842.7 | 2793.1 | 2771.9 |
| 27.5° | 3341.3 | 3339.0 | 3324.8 | 3289.4 | 3227.9 | 3128.7 | 2994.0 | 2859.3 | 2764.8 | 2698.6 | 2684.4 |
| 30° | 3405.1 | 3400.4 | 3383.9 | 3343.7 | 3275.2 | 3140.5 | 2951.4 | 2767.1 | 2649.0 | 2575.7 | 2554.5 |
| 32.5° | 3483.1 | 3478.4 | 3454.8 | 3405.1 | 3331.9 | 3142.9 | 2890.0 | 2649.0 | 2493.0 | 2415.0 | 2389.0 |
| 35° | 3587.1 | 3577.7 | 3546.9 | 3487.9 | 3386.2 | 3119.2 | 2781.3 | 2497.7 | 2306.3 | 2204.7 | 2169.3 |
| 37.5° | 3700.5 | 3688.7 | 3648.5 | 3575.3 | 3424.1 | 3055.4 | 2627.7 | 2294.5 | 2077.1 | 1956.6 | 1930.6 |
| 40° | 3839.9 | 3823.4 | 3762.0 | 3660.4 | 3438.2 | 2944.4 | 2455.2 | 2086.6 | 1855.0 | 1722.7 | 1691.9 |
| 42.5° | 4014.8 | 3986.5 | 3887.2 | 3754.9 | 3409.9 | 2793.1 | 2249.6 | 1871.5 | 1606.9 | 1484.0 | 1476.9 |
| 45° | 4225.1 | 4180.2 | 4031.4 | 3847.0 | 3348.4 | 2604.1 | 2032.2 | 1630.5 | 1377.7 | 1257.1 | 1226.4 |
| 47.5° | 4473.2 | 4418.9 | 4199.1 | 3917.9 | 3227.9 | 2410.3 | 1798.3 | 1396.6 | 1165.0 | 1042.1 | 1018.5 |
| 50° | 4747.4 | 4695.4 | 4376.4 | 3958.1 | 3098.0 | 2183.5 | 1569.1 | 1188.6 | 957.0 | 855.4 | 855.4 |
| 52.5° | 5080.5 | 4962.4 | 4546.5 | 3962.8 | 2899.5 | 1933.0 | 1349.3 | 985.4 | 803.4 | 713.6 | 694.7 |
| 55° | 5435.0 | 5295.6 | 4700.1 | 3920.3 | 2693.9 | 1703.8 | 1113.0 | 820.0 | 659.3 | 595.5 | 578.9 |
| 57.5° | 5829.6 | 5617.0 | 4811.2 | 3835.2 | 2433.9 | 1453.3 | 928.7 | 675.8 | 555.3 | 503.3 | 496.2 |
| 60° | 6226.6 | 5952.5 | 4877.3 | 3691.1 | 2157.5 | 1221.7 | 772.7 | 564.8 | 477.3 | 439.5 | 432.4 |
| 62.5° | 6595.3 | 6226.6 | 4882.1 | 3480.8 | 1888.1 | 1018.5 | 633.3 | 486.8 | 423.0 | 394.6 | 394.6 |
| 65° | 6914.3 | 6455.8 | 4801.7 | 3211.4 | 1545.4 | 817.6 | 522.2 | 411.2 | 368.6 | 337.9 | 330.8 |
| 67.5° | 7070.2 | 6543.3 | 4659.9 | 2842.7 | 1238.2 | 647.5 | 439.5 | 356.8 | 316.6 | 269.4 | 264.7 |
| 70° | 6850.5 | 6290.4 | 4296.0 | 2370.1 | 957.0 | 515.1 | 366.3 | 304.8 | 264.7 | 224.5 | 219.8 |
| 72.5° | 6148.6 | 5617.0 | 3707.6 | 1836.1 | 720.7 | 415.9 | 304.8 | 259.9 | 217.4 | 196.1 | 191.4 |
| 75° | 5030.9 | 4671.7 | 2930.2 | 1264.2 | 503.3 | 326.1 | 255.2 | 219.8 | 184.3 | 174.9 | 172.5 |
| 77.5° | 3818.7 | 3473.7 | 2140.9 | 791.6 | 345.0 | 255.2 | 217.4 | 186.7 | 160.7 | 167.8 | 163.1 |
| 80° | 2549.7 | 2391.4 | 1422.6 | 449.0 | 231.6 | 186.7 | 165.4 | 137.1 | 122.9 | 141.8 | 137.1 |
| 82.5° | 1157.9 | 1096.5 | 668.7 | 196.1 | 104.0 | 80.3 | 56.7 | 42.5 | 33.1 | 30.7 | 35.4 |
| 85° | 193.8 | 170.1 | 47.3 | 21.3 | 11.8 | 7.1 | 4.7 | 4.7 | 2.4 | 2.4 | 2.4 |
| 87.5° | 9.5 | 7.1 | 7.1 | 4.7 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 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: SP1-2407-157-3

Test Date: 08/07/2024

Luminaire Tested: MEM2-HTN-SA-40-727-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-40-727-U-5WQ-2

Test Information

Test Method: LM-79-2019
 Report Number: SP1-2407-157-3
 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-40-727-U-5WQ-2**
 Description: Epic Modern Light Square 40W 5WQ Optic and Flare Trim

Spectral Parameters

CCT (K): 2747
 CIE u': 0.2606
 CIE v': 0.5257
 Duv: -0.0005
 CIE x: 0.4552
 CIE y: 0.4082
 CIE z: 0.1366
 Peak Wavelength (nm): 597
 Dominant Wavelength (nm): 584
 Purity: 59.16856
 Rf: 75.5
 Rg: 93.6

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.7 | | |
| R1: | 68.1 | R9: | -35.3 |
| R2: | 83.9 | R10: | 64.2 |
| R3: | 94.7 | R11: | 61.7 |
| R4: | 66.3 | R12: | 53.9 |
| R5: | 67.4 | R13: | 71.2 |
| R6: | 78.7 | R14: | 97.6 |
| R7: | 75.0 | R15: | 59.3 |
| R8: | 39.4 | | |



Test Conditions

Stabilization Time: 22M
 Operation Time: 1H 22M
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2407-157-3

| 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: SP1-2407-157-3

CIE 1931 Chromaticity Diagram



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



CCT = 2747K
 CIE x = 0.4552
 CIE y = 0.4082
 Duv = -0.0005

Point lies inside the ANSI 2700K 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 | 103 | NR | 620 | 846 | NR | 750 | 20 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 130 | NR | 625 | 784 | NR | 755 | 17 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 171 | NR | 630 | 720 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 221 | NR | 635 | 652 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 268 | NR | 640 | 587 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 313 | NR | 645 | 521 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 350 | NR | 650 | 461 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 381 | NR | 655 | 406 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 407 | NR | 660 | 353 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 435 | NR | 665 | 307 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 462 | NR | 670 | 264 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 496 | NR | 675 | 227 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 20 | NR | 550 | 534 | NR | 680 | 196 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 38 | NR | 555 | 582 | NR | 685 | 167 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 69 | NR | 560 | 638 | NR | 690 | 144 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 120 | NR | 565 | 700 | NR | 695 | 122 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 193 | NR | 570 | 767 | NR | 700 | 103 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 316 | NR | 575 | 836 | NR | 705 | 88 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 469 | NR | 580 | 898 | NR | 710 | 74 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 431 | NR | 585 | 947 | NR | 715 | 63 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 264 | NR | 590 | 982 | NR | 720 | 54 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 197 | NR | 595 | 997 | NR | 725 | 46 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 155 | NR | 600 | 997 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 108 | NR | 605 | 978 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 90 | NR | 610 | 947 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 92 | NR | 615 | 900 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-157-3

Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.13

| 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 | 103 | NR | 620 | 846 | NR | 750 | 20 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 130 | NR | 625 | 784 | NR | 755 | 17 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 171 | NR | 630 | 720 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 221 | NR | 635 | 652 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 268 | NR | 640 | 587 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 313 | NR | 645 | 521 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 350 | NR | 650 | 461 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 381 | NR | 655 | 406 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 407 | NR | 660 | 353 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 435 | NR | 665 | 307 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 462 | NR | 670 | 264 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 496 | NR | 675 | 227 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 20 | NR | 550 | 534 | NR | 680 | 196 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 38 | NR | 555 | 582 | NR | 685 | 167 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 69 | NR | 560 | 638 | NR | 690 | 144 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 120 | NR | 565 | 700 | NR | 695 | 122 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 193 | NR | 570 | 767 | NR | 700 | 103 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 316 | NR | 575 | 836 | NR | 705 | 88 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 469 | NR | 580 | 898 | NR | 710 | 74 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 431 | NR | 585 | 947 | NR | 715 | 63 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 264 | NR | 590 | 982 | NR | 720 | 54 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 197 | NR | 595 | 997 | NR | 725 | 46 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 155 | NR | 600 | 997 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 108 | NR | 605 | 978 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 90 | NR | 610 | 947 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 92 | NR | 615 | 900 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-157-3

Melanopic Flux vs. Wavelength



Melanopic Lumens: NR M/P: 2.04

| 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 | 103 | NR | 620 | 846 | NR | 750 | 20 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 130 | NR | 625 | 784 | NR | 755 | 17 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 171 | NR | 630 | 720 | NR | 760 | 15 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 221 | NR | 635 | 652 | NR | 765 | 13 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 268 | NR | 640 | 587 | NR | 770 | 11 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 313 | NR | 645 | 521 | NR | 775 | 9 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 350 | NR | 650 | 461 | NR | 780 | 8 | NR | 910 | 0 | NR |
| 395 | 0 | NR | 525 | 381 | NR | 655 | 406 | NR | 785 | 7 | NR | 915 | 0 | NR |
| 400 | 0 | NR | 530 | 407 | NR | 660 | 353 | NR | 790 | 6 | NR | 920 | 0 | NR |
| 405 | 2 | NR | 535 | 435 | NR | 665 | 307 | NR | 795 | 5 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 462 | NR | 670 | 264 | NR | 800 | 4 | NR | 930 | 0 | NR |
| 415 | 9 | NR | 545 | 496 | NR | 675 | 227 | NR | 805 | 4 | NR | 935 | 0 | NR |
| 420 | 20 | NR | 550 | 534 | NR | 680 | 196 | NR | 810 | 3 | NR | 940 | 0 | NR |
| 425 | 38 | NR | 555 | 582 | NR | 685 | 167 | NR | 815 | 3 | NR | 945 | 0 | NR |
| 430 | 69 | NR | 560 | 638 | NR | 690 | 144 | NR | 820 | 2 | NR | 950 | 0 | NR |
| 435 | 120 | NR | 565 | 700 | NR | 695 | 122 | NR | 825 | 2 | NR | 955 | 0 | NR |
| 440 | 193 | NR | 570 | 767 | NR | 700 | 103 | NR | 830 | 2 | NR | 960 | 0 | NR |
| 445 | 316 | NR | 575 | 836 | NR | 705 | 88 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 469 | NR | 580 | 898 | NR | 710 | 74 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 431 | NR | 585 | 947 | NR | 715 | 63 | NR | 845 | 1 | NR | 975 | 0 | NR |
| 460 | 264 | NR | 590 | 982 | NR | 720 | 54 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 197 | NR | 595 | 997 | NR | 725 | 46 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 155 | NR | 600 | 997 | NR | 730 | 39 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 108 | NR | 605 | 978 | NR | 735 | 33 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 90 | NR | 610 | 947 | NR | 740 | 28 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 92 | NR | 615 | 900 | NR | 745 | 24 | NR | 875 | 1 | NR | | | |

Summary

$R_f = 75.5$
 $R_g = 93.6$
 $CIE R_a = 71.7$
 $R_g = -35.3$



Color Vector Graphics



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

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 90 | CES52 = 85 | CES77 = 79 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 66 |
| CES04 = 71 | CES29 = 71 | CES54 = 86 | CES79 = 87 |
| CES05 = 50 | CES30 = 85 | CES55 = 84 | CES80 = 85 |
| CES06 = 52 | CES31 = 74 | CES56 = 75 | CES81 = 67 |
| CES07 = 42 | CES32 = 66 | CES57 = 75 | CES82 = 93 |
| CES08 = 41 | CES33 = 80 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 77 | CES35 = 89 | CES60 = 90 | CES85 = 72 |
| CES11 = 60 | CES36 = 93 | CES61 = 81 | CES86 = 59 |
| CES12 = 66 | CES37 = 88 | CES62 = 91 | CES87 = 77 |
| CES13 = 43 | CES38 = 93 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 97 | CES64 = 67 | CES89 = 65 |
| CES15 = 72 | CES40 = 93 | CES65 = 66 | CES90 = 80 |
| CES16 = 48 | CES41 = 93 | CES66 = 63 | CES91 = 80 |
| CES17 = 51 | CES42 = 89 | CES67 = 61 | CES92 = 55 |
| CES18 = 57 | CES43 = 78 | CES68 = 68 | CES93 = 72 |
| CES19 = 73 | CES44 = 99 | CES69 = 78 | CES94 = 48 |
| CES20 = 67 | CES45 = 85 | CES70 = 63 | CES95 = 66 |
| CES21 = 88 | CES46 = 81 | CES71 = 61 | CES96 = 76 |
| CES22 = 80 | CES47 = 86 | CES72 = 86 | CES97 = 81 |
| CES23 = 92 | CES48 = 74 | CES73 = 56 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 93 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 66 | |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)