

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: STREETWORKS

Report Number: P867558

Luminaire Tested: **MEM2-HTN-SA-100-740-U-T2U**

Issue Date: 08/21/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P867558  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: MEM2-HTN-SA-100-740-U-T2U  
Description: EPIC MODERN TALL HOUSING DISCRETE LED ARRAYS 100W 70CRI 4000K  
FITXURE w/ TYPE II URBAN DISTRIBUTION OPTIC  
Light Source: (20) 4000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

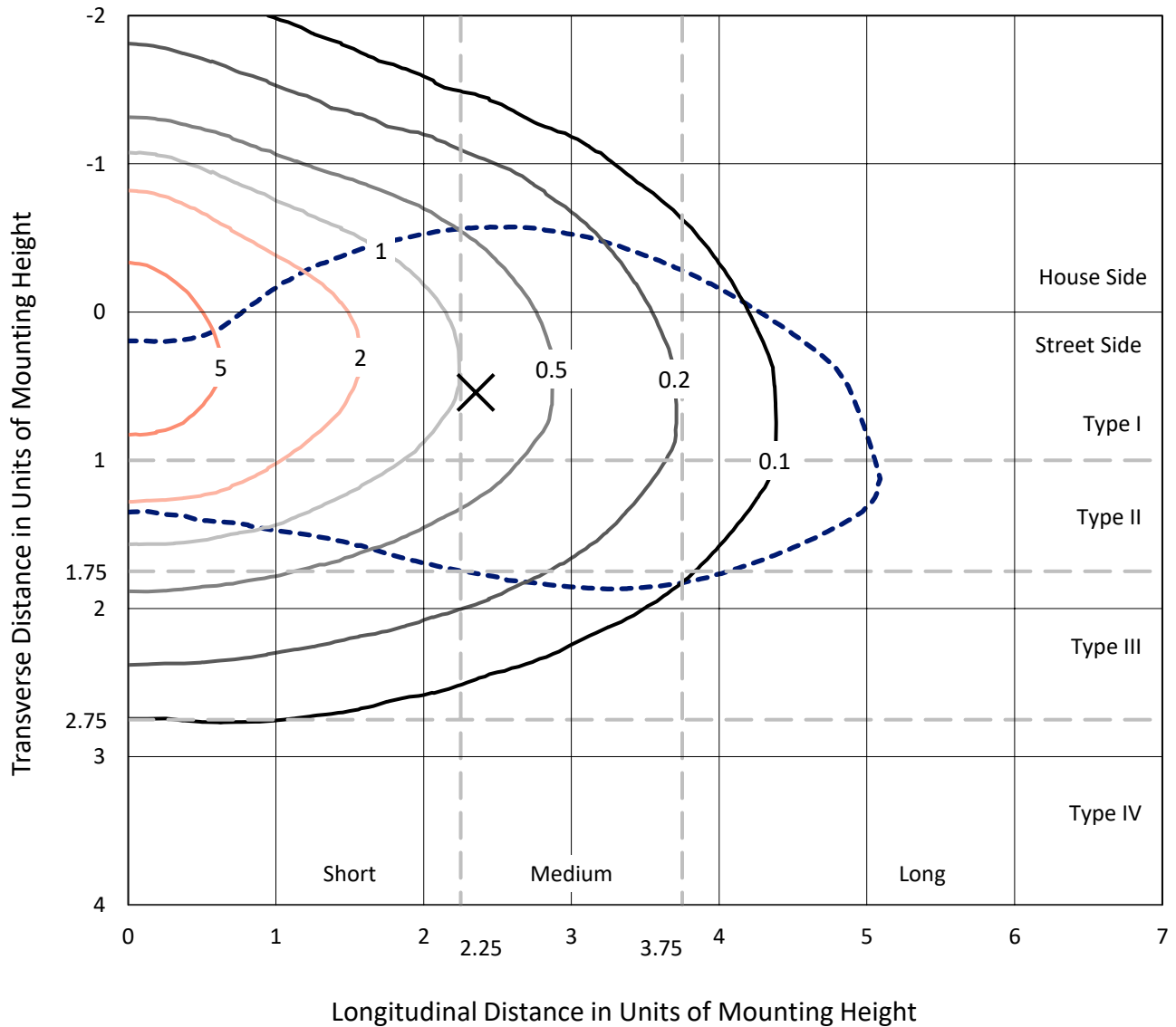
Lumens per Lamp: N/A  
Luminaire Lumens: 13864.7 lumens  
Efficiency: N/A  
Efficacy: 137.3 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.33' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B3 - U0 - G3

Input Watts (W): 101  
Input Voltage (V): 120  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: 0.99  
Total Harmonic Distortion (THDi): 9.45%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

REPORT NUMBER: P867558  
 CATALOG NUMBER: MEM2-HTN-SA-100-740-U-T2U

### Iso-Footcandle Lines of Horizontal Illumination

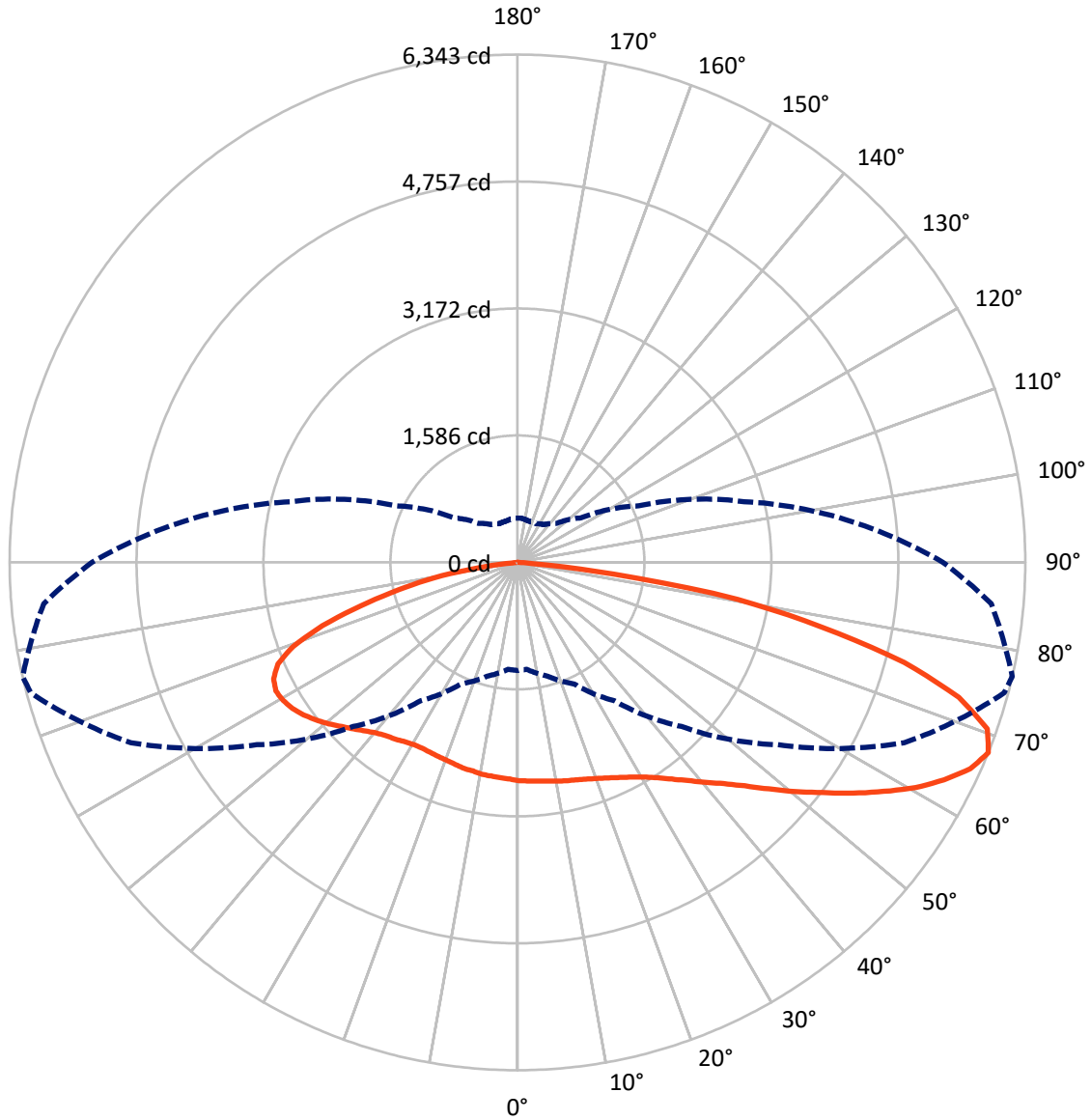
× Max cd  
 - - - 1/2 Max cd



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

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### Luminous Intensity Polar Plot



— Vertical Plane Through 77-Deg Lateral      - - - Horizontal Cone Through 67.5-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 4610.5   | 0.0    | 4610.5  |
|                    | % Fixture | 33.3     | 0.0    | 33.3    |
| <b>Street Side</b> | Lumens    | 9254.2   | 0.0    | 9254.2  |
|                    | % Fixture | 66.7     | 0.0    | 66.7    |
| <b>Total</b>       | Lumens    | 13864.7  | 0.0    | 13864.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 262.0   | 1.9       |
| 10°-20°   | 794.6   | 5.7       |
| 20°-30°   | 1339.6  | 9.7       |
| 30°-40°   | 1901.0  | 13.7      |
| 40°-50°   | 2405.2  | 17.3      |
| 50°-60°   | 2634.8  | 19.0      |
| 60°-70°   | 2546.9  | 18.4      |
| 70°-80°   | 1712.9  | 12.4      |
| 80°-90°   | 267.7   | 1.9       |
| 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°    | 13864.7 | 100.0     |
| 0°-180°   | 13864.7 | 100.0     |

**Coefficient of Utilization**



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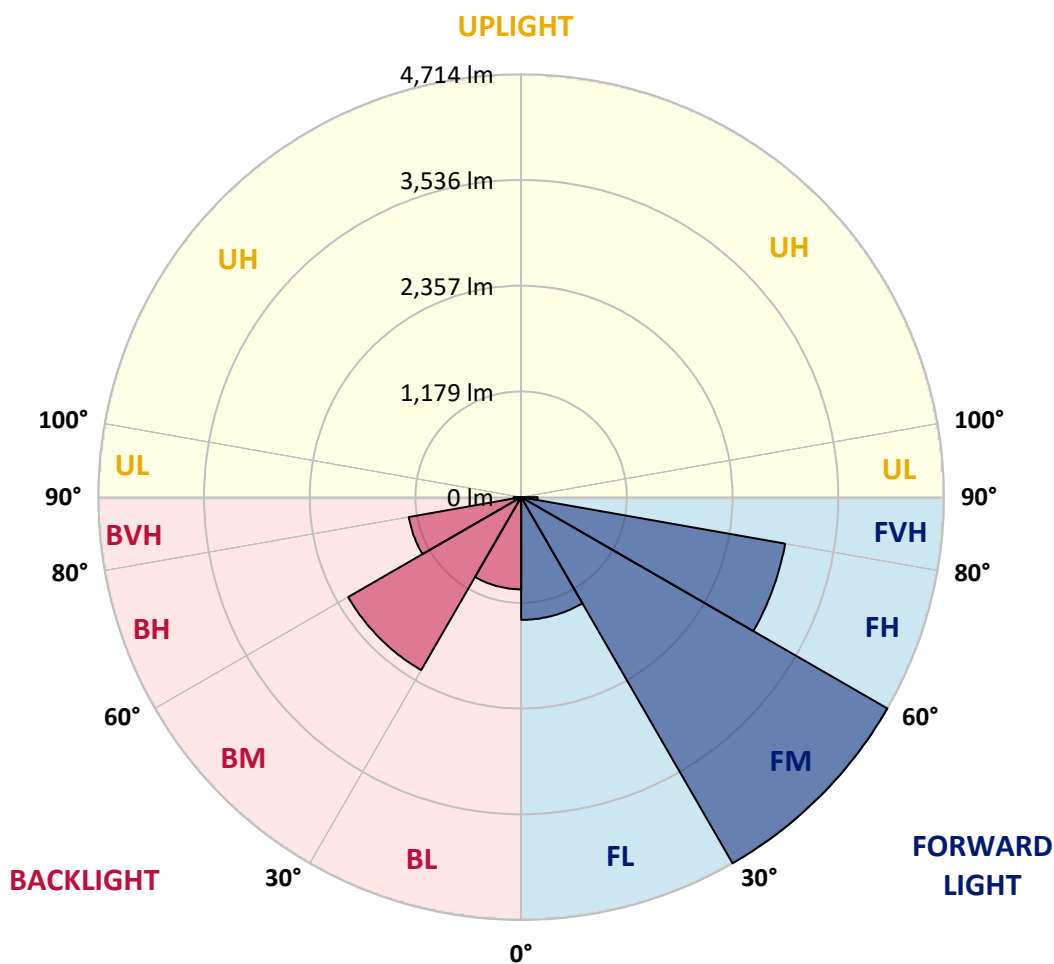
CATALOG NUMBER: MEM2-HTN-SA-100-740-U-T2U

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 1368.5 | 9.9       |                         |      |         |
| FM (30°-60°)   | 4714.2 | 34.0      |                         |      |         |
| FH (60°-80°)   | 2988.3 | 21.6      |                         |      | G2/5000 |
| FVH (80°-90°)  | 183.3  | 1.3       |                         |      | G2/225  |
| BL (0°-30°)    | 1027.8 | 7.4       | B3/2500                 |      |         |
| BM (30°-60°)   | 2226.8 | 16.1      | B2/2500                 |      |         |
| BH (60°-80°)   | 1271.6 | 9.2       | B3/2500                 |      | G3/2500 |
| BVH (80°-90°)  | 84.4   | 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 III Medium





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CATALOG NUMBER: MEM2-HTN-SA-100-740-U-T2U

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 77°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 |
| 2.5°  | 2786.3 | 2783.5 | 2769.8 | 2775.3 | 2758.9 | 2769.8 | 2753.4 | 2739.7 | 2736.9 | 2734.2 | 2736.9 |
| 5°    | 2874.0 | 2860.3 | 2846.6 | 2838.4 | 2824.7 | 2819.2 | 2791.8 | 2764.3 | 2747.9 | 2745.1 | 2739.7 |
| 7.5°  | 2975.5 | 2970.0 | 2950.8 | 2939.9 | 2901.5 | 2882.3 | 2843.9 | 2794.5 | 2769.8 | 2758.9 | 2745.1 |
| 10°   | 3079.7 | 3093.4 | 3068.7 | 3046.8 | 3002.9 | 2961.8 | 2896.0 | 2832.9 | 2783.5 | 2778.1 | 2747.9 |
| 12.5° | 3208.6 | 3205.9 | 3189.4 | 3151.0 | 3098.9 | 3041.3 | 2961.8 | 2874.0 | 2808.2 | 2797.3 | 2753.4 |
| 15°   | 3323.8 | 3321.0 | 3299.1 | 3263.5 | 3194.9 | 3123.6 | 3016.6 | 2915.2 | 2832.9 | 2816.4 | 2764.3 |
| 17.5° | 3430.7 | 3425.3 | 3411.5 | 3373.2 | 3288.1 | 3200.4 | 3096.2 | 2961.8 | 2863.1 | 2843.9 | 2772.6 |
| 20°   | 3524.0 | 3529.5 | 3513.0 | 3474.6 | 3395.1 | 3301.9 | 3170.2 | 3022.1 | 2901.5 | 2879.5 | 2797.3 |
| 22.5° | 3625.5 | 3628.2 | 3620.0 | 3606.3 | 3504.8 | 3406.1 | 3263.5 | 3090.7 | 2945.3 | 2923.4 | 2824.7 |
| 25°   | 3732.4 | 3735.2 | 3740.6 | 3732.4 | 3617.2 | 3510.3 | 3359.4 | 3175.7 | 3005.7 | 2975.5 | 2863.1 |
| 27.5° | 3855.8 | 3858.6 | 3869.5 | 3853.1 | 3729.7 | 3617.2 | 3466.4 | 3266.2 | 3068.7 | 3035.8 | 2896.0 |
| 30°   | 3995.7 | 4006.7 | 3998.4 | 3992.9 | 3850.3 | 3740.6 | 3573.4 | 3359.4 | 3151.0 | 3109.9 | 2953.6 |
| 32.5° | 4163.0 | 4160.2 | 4143.8 | 4127.3 | 3982.0 | 3866.8 | 3694.0 | 3480.1 | 3252.5 | 3205.9 | 3046.8 |
| 35°   | 4283.6 | 4283.6 | 4259.0 | 4250.7 | 4116.3 | 3995.7 | 3825.7 | 3614.5 | 3367.7 | 3323.8 | 3145.5 |
| 37.5° | 4357.7 | 4368.6 | 4349.5 | 4354.9 | 4226.0 | 4113.6 | 3957.3 | 3751.6 | 3493.8 | 3455.4 | 3266.2 |
| 40°   | 4385.1 | 4412.5 | 4429.0 | 4450.9 | 4322.0 | 4226.0 | 4097.1 | 3899.7 | 3655.6 | 3611.7 | 3411.5 |
| 42.5° | 4390.6 | 4431.7 | 4489.3 | 4535.9 | 4390.6 | 4311.1 | 4231.5 | 4050.5 | 3814.7 | 3776.3 | 3570.6 |
| 45°   | 4363.2 | 4344.0 | 4483.8 | 4489.3 | 4429.0 | 4379.6 | 4349.5 | 4231.5 | 4045.0 | 3982.0 | 3768.1 |
| 47.5° | 4154.7 | 4132.8 | 4171.2 | 4346.7 | 4382.4 | 4409.8 | 4470.1 | 4442.7 | 4275.4 | 4226.0 | 3995.7 |
| 50°   | 3817.4 | 3806.5 | 3960.0 | 4149.3 | 4267.2 | 4407.0 | 4568.8 | 4645.6 | 4530.4 | 4500.3 | 4283.6 |
| 52.5° | 3260.7 | 3230.6 | 3543.2 | 3910.7 | 4116.3 | 4379.6 | 4637.4 | 4854.1 | 4818.4 | 4774.5 | 4530.4 |
| 55°   | 2906.9 | 2906.9 | 3118.1 | 3576.1 | 3924.4 | 4280.9 | 4681.3 | 5073.4 | 5136.5 | 5087.2 | 4812.9 |
| 57.5° | 2528.5 | 2558.7 | 2778.1 | 3093.4 | 3647.4 | 4099.9 | 4675.8 | 5257.2 | 5443.7 | 5397.0 | 5111.8 |
| 60°   | 2204.9 | 2229.6 | 2355.7 | 2673.8 | 3321.0 | 3861.3 | 4615.5 | 5408.0 | 5728.9 | 5712.4 | 5375.1 |
| 62.5° | 1875.8 | 1906.0 | 2007.4 | 2306.4 | 2890.5 | 3587.1 | 4489.3 | 5490.3 | 5997.6 | 5981.2 | 5641.1 |
| 65°   | 1612.5 | 1615.3 | 1716.7 | 1966.3 | 2459.9 | 3255.2 | 4267.2 | 5473.8 | 6206.1 | 6217.0 | 5866.0 |
| 67.5° | 1349.3 | 1341.0 | 1472.7 | 1675.6 | 2108.9 | 2898.7 | 3971.0 | 5328.5 | 6293.8 | 6343.2 | 5940.0 |
| 70°   | 992.7  | 1003.7 | 1187.5 | 1412.3 | 1782.6 | 2487.4 | 3556.9 | 5046.0 | 6151.2 | 6228.0 | 5770.0 |
| 72.5° | 745.9  | 767.9  | 946.1  | 1179.2 | 1489.1 | 2076.0 | 3104.4 | 4555.1 | 5753.6 | 5764.5 | 5251.7 |
| 75°   | 606.1  | 611.6  | 770.6  | 979.0  | 1220.4 | 1664.6 | 2492.8 | 3803.7 | 4865.0 | 4991.2 | 4461.9 |
| 77.5° | 515.6  | 510.1  | 586.9  | 789.8  | 984.5  | 1330.1 | 1878.5 | 2893.2 | 3820.2 | 3877.8 | 3493.8 |
| 80°   | 438.8  | 436.0  | 463.5  | 639.0  | 770.6  | 948.9  | 1286.2 | 2015.7 | 2725.9 | 2789.0 | 2481.9 |
| 82.5° | 230.4  | 246.8  | 241.3  | 394.9  | 436.0  | 499.1  | 617.0  | 916.0  | 1190.2 | 1206.7 | 1140.8 |
| 85°   | 11.0   | 11.0   | 11.0   | 16.5   | 27.4   | 43.9   | 85.0   | 85.0   | 93.2   | 178.3  | 202.9  |
| 87.5° | 2.7    | 2.7    | 5.5    | 5.5    | 5.5    | 8.2    | 8.2    | 11.0   | 11.0   | 11.0   | 11.0   |
| 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: P867558

CATALOG NUMBER: MEM2-HTN-SA-100-740-U-T2U

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 | 2725.9 |
| 2.5°  | 2731.4 | 2720.5 | 2704.0 | 2706.8 | 2704.0 | 2704.0 | 2690.3 | 2679.3 | 2676.6 | 2682.1 | 2693.0 |
| 5°    | 2734.2 | 2717.7 | 2693.0 | 2684.8 | 2676.6 | 2671.1 | 2649.2 | 2632.7 | 2624.5 | 2630.0 | 2632.7 |
| 7.5°  | 2734.2 | 2709.5 | 2682.1 | 2665.6 | 2643.7 | 2627.2 | 2602.5 | 2580.6 | 2569.6 | 2572.4 | 2577.9 |
| 10°   | 2728.7 | 2701.3 | 2679.3 | 2646.4 | 2610.8 | 2591.6 | 2553.2 | 2525.8 | 2512.0 | 2514.8 | 2501.1 |
| 12.5° | 2728.7 | 2698.5 | 2654.6 | 2624.5 | 2575.1 | 2534.0 | 2503.8 | 2473.6 | 2462.7 | 2451.7 | 2446.2 |
| 15°   | 2731.4 | 2693.0 | 2649.2 | 2586.1 | 2528.5 | 2484.6 | 2446.2 | 2427.0 | 2410.6 | 2405.1 | 2407.8 |
| 17.5° | 2731.4 | 2693.0 | 2627.2 | 2553.2 | 2487.4 | 2432.5 | 2399.6 | 2377.7 | 2372.2 | 2366.7 | 2366.7 |
| 20°   | 2745.1 | 2695.8 | 2608.0 | 2520.3 | 2438.0 | 2380.4 | 2350.2 | 2336.5 | 2336.5 | 2328.3 | 2328.3 |
| 22.5° | 2767.1 | 2701.3 | 2597.1 | 2492.8 | 2396.9 | 2333.8 | 2300.9 | 2284.4 | 2292.6 | 2287.2 | 2284.4 |
| 25°   | 2791.8 | 2720.5 | 2583.3 | 2454.5 | 2342.0 | 2276.2 | 2243.3 | 2232.3 | 2229.6 | 2215.9 | 2235.1 |
| 27.5° | 2811.0 | 2734.2 | 2575.1 | 2416.1 | 2292.6 | 2215.9 | 2174.7 | 2155.5 | 2141.8 | 2147.3 | 2141.8 |
| 30°   | 2863.1 | 2772.6 | 2577.9 | 2383.1 | 2237.8 | 2144.6 | 2095.2 | 2073.3 | 2067.8 | 2067.8 | 2067.8 |
| 32.5° | 2934.4 | 2821.9 | 2597.1 | 2369.4 | 2185.7 | 2076.0 | 2015.7 | 1993.7 | 1988.2 | 1977.3 | 1982.8 |
| 35°   | 3024.9 | 2896.0 | 2627.2 | 2347.5 | 2144.6 | 1996.5 | 1930.7 | 1900.5 | 1892.3 | 1881.3 | 1881.3 |
| 37.5° | 3126.3 | 2970.0 | 2649.2 | 2336.5 | 2089.7 | 1914.2 | 1840.2 | 1801.8 | 1796.3 | 1785.3 | 1790.8 |
| 40°   | 3255.2 | 3071.5 | 2684.8 | 2314.6 | 2026.6 | 1840.2 | 1741.4 | 1678.4 | 1692.1 | 1697.5 | 1708.5 |
| 42.5° | 3400.6 | 3200.4 | 2739.7 | 2292.6 | 1977.3 | 1763.4 | 1618.0 | 1554.9 | 1571.4 | 1565.9 | 1576.9 |
| 45°   | 3598.0 | 3351.2 | 2808.2 | 2284.4 | 1916.9 | 1670.1 | 1491.9 | 1420.6 | 1415.1 | 1406.9 | 1412.3 |
| 47.5° | 3803.7 | 3532.2 | 2874.0 | 2268.0 | 1851.1 | 1554.9 | 1349.3 | 1258.8 | 1236.8 | 1225.9 | 1214.9 |
| 50°   | 4017.6 | 3713.2 | 2950.8 | 2257.0 | 1763.4 | 1426.0 | 1206.7 | 1102.4 | 1061.3 | 1047.6 | 1033.9 |
| 52.5° | 4259.0 | 3907.9 | 3016.6 | 2229.6 | 1667.4 | 1291.7 | 1077.8 | 959.8  | 913.2  | 885.8  | 888.5  |
| 55°   | 4514.0 | 4086.2 | 3077.0 | 2196.7 | 1557.7 | 1165.5 | 948.9  | 850.1  | 803.5  | 795.3  | 795.3  |
| 57.5° | 4749.8 | 4269.9 | 3120.9 | 2139.1 | 1448.0 | 1042.1 | 841.9  | 756.9  | 735.0  | 745.9  | 745.9  |
| 60°   | 4991.2 | 4418.0 | 3142.8 | 2076.0 | 1335.6 | 937.9  | 767.9  | 699.3  | 688.3  | 710.3  | 713.0  |
| 62.5° | 5185.9 | 4535.9 | 3137.3 | 1988.2 | 1212.1 | 847.4  | 696.6  | 641.7  | 647.2  | 685.6  | 693.8  |
| 65°   | 5325.7 | 4593.5 | 3068.7 | 1856.6 | 1094.2 | 767.9  | 633.5  | 581.4  | 581.4  | 608.8  | 617.0  |
| 67.5° | 5314.8 | 4519.5 | 2931.6 | 1672.9 | 968.1  | 688.3  | 575.9  | 534.8  | 534.8  | 554.0  | 551.2  |
| 70°   | 5089.9 | 4264.4 | 2671.1 | 1450.7 | 844.7  | 619.8  | 526.5  | 496.4  | 493.6  | 501.9  | 499.1  |
| 72.5° | 4549.6 | 3746.1 | 2265.2 | 1198.4 | 729.5  | 551.2  | 477.2  | 449.8  | 444.3  | 433.3  | 425.1  |
| 75°   | 3754.3 | 3077.0 | 1768.8 | 954.4  | 617.0  | 485.4  | 430.6  | 405.9  | 383.9  | 397.6  | 389.4  |
| 77.5° | 2912.4 | 2361.2 | 1316.4 | 740.4  | 501.9  | 422.3  | 383.9  | 356.5  | 351.0  | 400.4  | 383.9  |
| 80°   | 2125.4 | 1631.7 | 929.7  | 529.3  | 389.4  | 342.8  | 320.9  | 298.9  | 378.5  | 507.3  | 504.6  |
| 82.5° | 943.4  | 787.1  | 425.1  | 252.3  | 181.0  | 150.8  | 126.2  | 142.6  | 238.6  | 233.1  | 241.3  |
| 85°   | 85.0   | 87.8   | 46.6   | 30.2   | 19.2   | 16.5   | 11.0   | 11.0   | 8.2    | 8.2    | 8.2    |
| 87.5° | 11.0   | 11.0   | 8.2    | 8.2    | 5.5    | 5.5    | 5.5    | 5.5    | 2.7    | 2.7    | 2.7    |
| 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-30-740-U-5WQ-2

Data in this report applies to families of products including MEM2-HTN-SA-30-740-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-30-740-U-5WQ-2**  
 Description: Epic Modern Light Square 30W 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<sub>f</sub>: 73.2  
 R<sub>g</sub>: 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



Point lies inside the ANSI 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



**Photopic Lumens: NR**

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /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 <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /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 <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /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)