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: McGRAW-EDISON

Report Number: P821268

Luminaire Tested: **TT-D1-740-24VDC-MQ-HSS**

Issue Date: 12/2/2020

Report Generated By 670245763

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Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P821268 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2010-017-1) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 12/2/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | TT-D1-740-24VDC-MQ-HSS |
| Description: | TOPTIER LED PARKING GARAGE LUMINAIRE |
| | 4000K, 70 CRI LEDS AND MEDIUM DISTRIBUTION WITH HOUSE SIDE SHIELD |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 3448 lumens |
| Efficiency: | N/A |
| Efficacy: | 123.1 lumens/watt |
| Luminous Opening: | Circular (Dia: 1.12' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B1 - U1 - G2 |

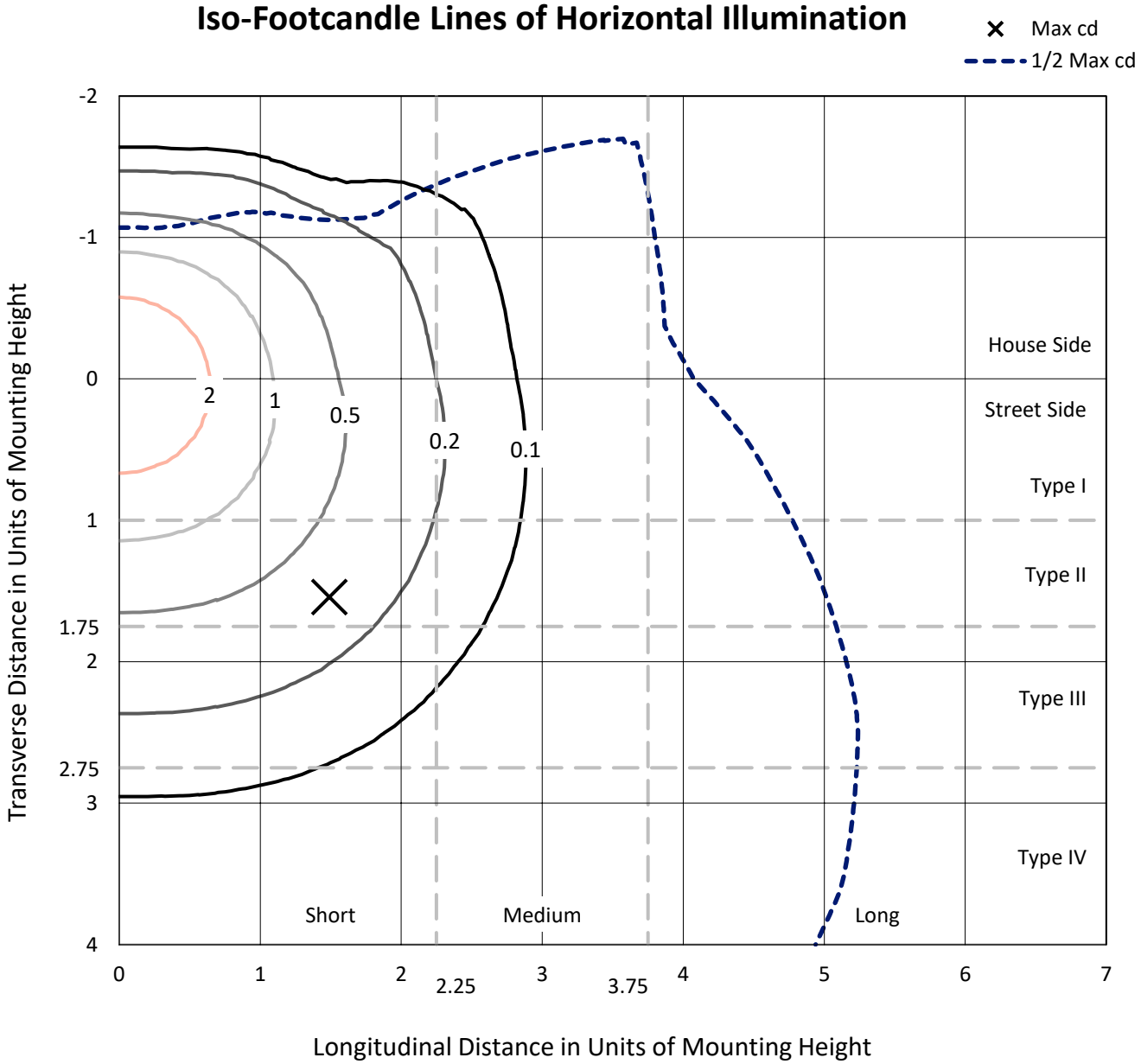
| | |
|---|---|
| Input Watts (W): | 28 |
| Input Voltage (V): | NR |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 25 FT |

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## Iso-Footcandle Lines of Horizontal Illumination



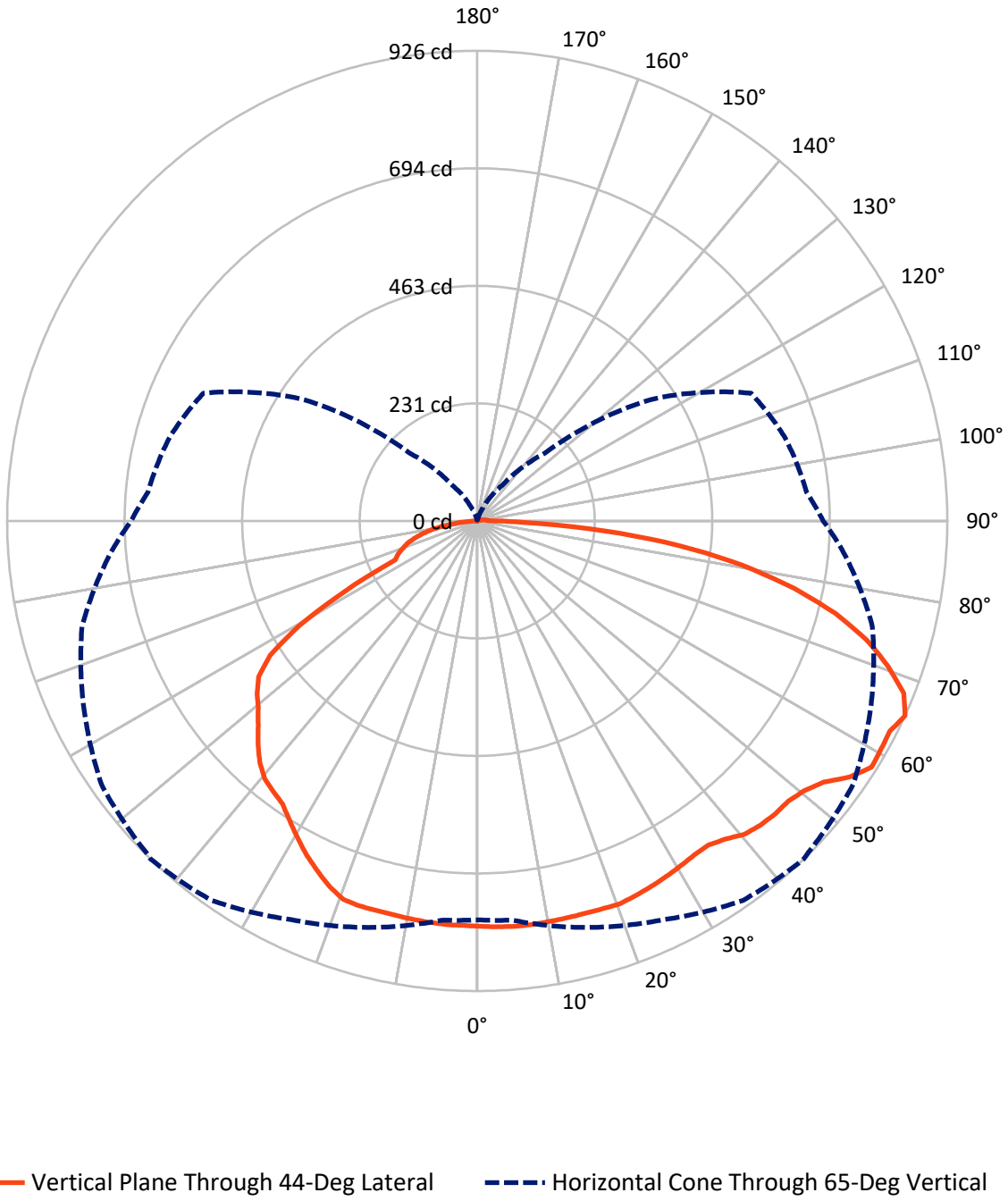

Based on 15 foot mounting height. Maximum calculated value = 3.5 fc
Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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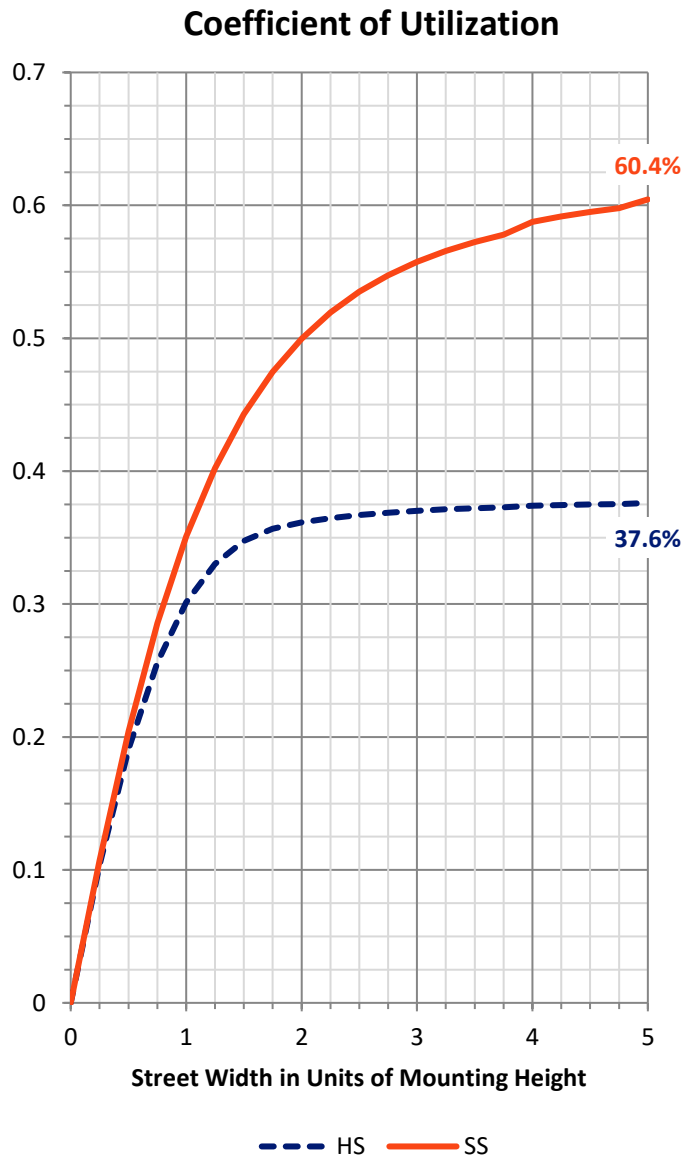
REPORT NUMBER: P821268
CATALOG NUMBER: TT-D1-740-24VDC-MQ-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1305.6 | 0.9 | 1306.5 |
| | % Fixture | 37.9 | 0.0 | 37.9 |
| **Street Side** | Lumens | 2129.8 | 11.7 | 2141.5 |
| | % Fixture | 61.8 | 0.3 | 62.1 |
| **Total** | Lumens | 3435.4 | 12.6 | 3448.0 |
| | % Fixture | 99.6 | 0.4 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 76.2 | 2.2 |
| 10°-20° | 225.6 | 6.5 |
| 20°-30° | 359.1 | 10.4 |
| 30°-40° | 460.0 | 13.3 |
| 40°-50° | 545.0 | 15.8 |
| 50°-60° | 596.9 | 17.3 |
| 60°-70° | 567.4 | 16.5 |
| 70°-80° | 451.7 | 13.1 |
| 80°-90° | 153.5 | 4.5 |
| 90°-100° | 8.1 | 0.2 |
| 100°-110° | 2.7 | 0.1 |
| 110°-120° | 0.6 | 0.0 |
| 120°-130° | 0.4 | 0.0 |
| 130°-140° | 0.3 | 0.0 |
| 140°-150° | 0.3 | 0.0 |
| 150°-160° | 0.2 | 0.0 |
| 160°-170° | 0.1 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 3435.4 | 99.6 |
| 0°-180° | 3448.0 | 100.0 |



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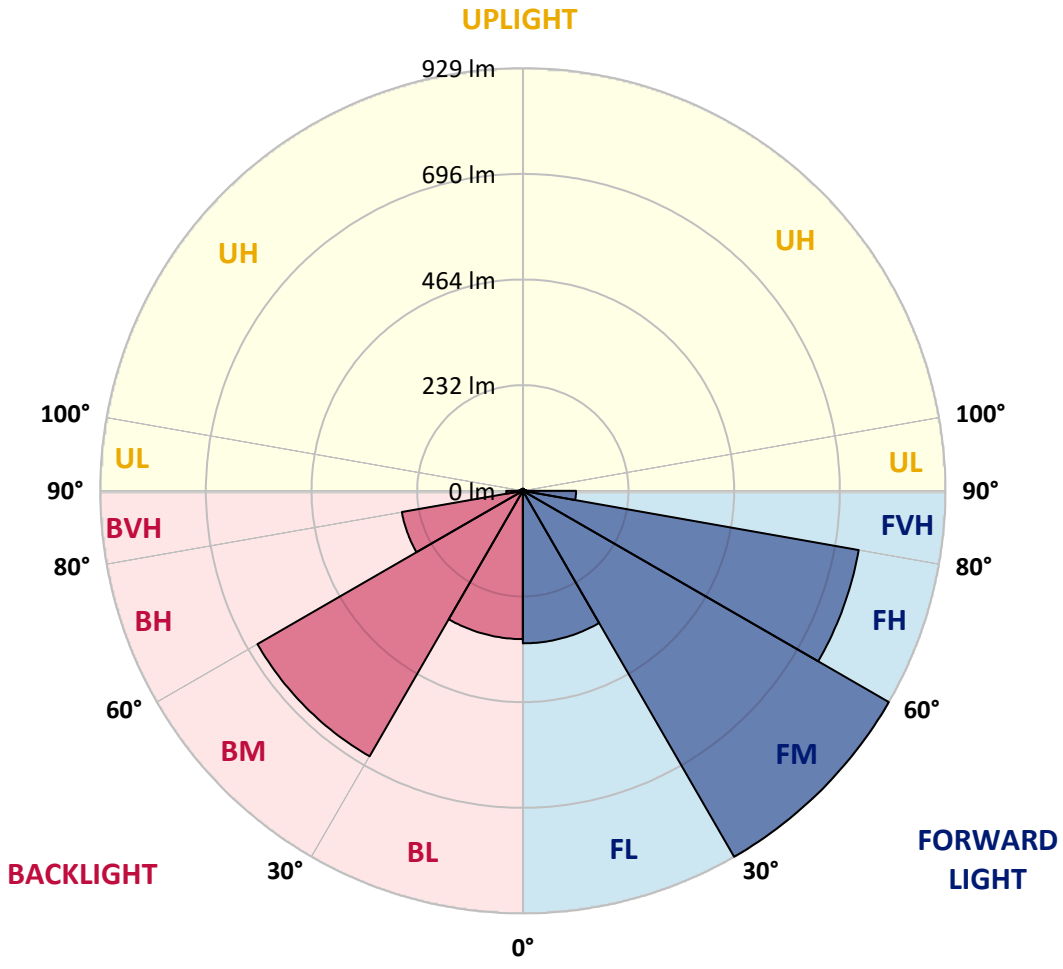
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## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 335.1 | 9.7 | | | |
| FM | (30°-60°) | 928.5 | 26.9 | | | |
| FH | (60°-80°) | 749.3 | 21.7 | | | G1/1800 |
| FVH | (80°-90°) | 116.9 | 3.4 | | | G2/225 |
| BL | (0°-30°) | 325.8 | 9.4 | B1/500 | | |
| BM | (30°-60°) | 673.4 | 19.5 | B1/1000 | | |
| BH | (60°-80°) | 269.8 | 7.8 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 36.6 | 1.1 | | | G1/100 |
| UL | (90°-100°) | 8.1 | 0.2 | | U1/10 | |
| UH | (100°-180°) | 4.5 | 0.1 | | U1/10 | |

**BUG Rating: B1-U1-G2**
Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 44° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 |
| 2.5° | 801.2 | 800.6 | 800.6 | 800.6 | 800.6 | 800.0 | 800.6 | 799.4 | 800.0 | 798.2 | 798.2 |
| 5° | 803.1 | 801.8 | 802.5 | 802.5 | 802.5 | 801.8 | 802.5 | 800.6 | 801.2 | 798.8 | 798.2 |
| 7.5° | 803.7 | 803.1 | 803.1 | 803.1 | 803.1 | 801.8 | 802.5 | 801.2 | 800.6 | 798.8 | 797.6 |
| 10° | 803.7 | 803.1 | 803.1 | 803.1 | 802.5 | 801.2 | 801.8 | 800.0 | 800.0 | 797.6 | 796.4 |
| 12.5° | 803.7 | 803.1 | 803.7 | 802.5 | 802.5 | 801.2 | 801.2 | 799.4 | 799.4 | 796.4 | 795.1 |
| 15° | 803.1 | 802.5 | 802.5 | 803.1 | 802.5 | 801.2 | 801.2 | 799.4 | 798.8 | 795.1 | 793.9 |
| 17.5° | 802.5 | 801.8 | 802.5 | 803.1 | 803.7 | 802.5 | 803.1 | 800.0 | 798.8 | 795.1 | 793.3 |
| 20° | 803.1 | 802.5 | 803.1 | 804.3 | 804.3 | 804.3 | 804.3 | 801.2 | 798.8 | 795.1 | 792.1 |
| 22.5° | 801.2 | 801.2 | 801.2 | 801.2 | 802.5 | 800.6 | 800.6 | 798.8 | 795.8 | 792.7 | 789.7 |
| 25° | 797.0 | 797.0 | 797.6 | 798.2 | 798.2 | 797.0 | 796.4 | 794.5 | 792.1 | 788.4 | 784.8 |
| 27.5° | 792.1 | 792.1 | 792.7 | 792.7 | 793.9 | 792.7 | 792.1 | 789.7 | 787.2 | 783.0 | 778.7 |
| 30° | 786.6 | 786.6 | 786.6 | 787.8 | 788.4 | 788.4 | 787.8 | 784.8 | 781.7 | 776.9 | 771.4 |
| 32.5° | 780.5 | 780.5 | 782.3 | 783.6 | 784.2 | 784.2 | 784.2 | 780.5 | 776.9 | 770.8 | 762.8 |
| 35° | 775.6 | 775.6 | 778.1 | 782.3 | 784.8 | 783.6 | 783.0 | 780.5 | 775.0 | 768.3 | 755.5 |
| 37.5° | 778.7 | 778.7 | 784.2 | 790.3 | 795.8 | 794.5 | 794.5 | 790.3 | 783.0 | 772.0 | 756.1 |
| 40° | 786.0 | 786.6 | 795.1 | 803.1 | 809.8 | 811.0 | 811.0 | 806.1 | 795.1 | 781.1 | 759.2 |
| 42.5° | 787.8 | 789.0 | 797.6 | 809.2 | 815.2 | 818.3 | 818.3 | 811.6 | 800.0 | 783.6 | 758.0 |
| 45° | 787.8 | 788.4 | 798.2 | 810.4 | 820.1 | 822.6 | 822.6 | 815.2 | 800.6 | 784.8 | 753.7 |
| 47.5° | 787.8 | 787.2 | 795.8 | 812.8 | 822.6 | 824.4 | 824.4 | 816.5 | 802.5 | 782.3 | 747.6 |
| 50° | 786.0 | 789.0 | 801.8 | 815.2 | 832.3 | 834.7 | 834.1 | 825.6 | 806.1 | 785.4 | 742.7 |
| 52.5° | 790.3 | 789.7 | 806.7 | 833.5 | 848.8 | 854.2 | 854.9 | 843.9 | 823.8 | 793.9 | 739.7 |
| 55° | 807.9 | 808.5 | 825.0 | 856.1 | 879.2 | 889.6 | 888.4 | 874.4 | 845.7 | 811.0 | 748.2 |
| 57.5° | 814.0 | 820.1 | 843.9 | 870.7 | 906.0 | 915.2 | 915.2 | 898.1 | 863.4 | 824.4 | 754.3 |
| 60° | 801.8 | 804.3 | 833.5 | 879.2 | 911.5 | 913.3 | 914.0 | 901.8 | 865.2 | 817.1 | 742.1 |
| 62.5° | 798.8 | 803.7 | 826.2 | 877.4 | 898.1 | 911.5 | 910.9 | 894.5 | 863.4 | 811.6 | 737.9 |
| 65° | 785.4 | 789.0 | 828.7 | 866.4 | 912.1 | 925.5 | 922.5 | 903.6 | 855.5 | 805.5 | 724.5 |
| 67.5° | 758.0 | 761.6 | 798.2 | 851.2 | 892.6 | 905.4 | 908.5 | 886.5 | 836.6 | 776.9 | 695.8 |
| 70° | 712.3 | 717.8 | 754.9 | 806.7 | 850.6 | 857.9 | 856.7 | 843.3 | 793.3 | 729.3 | 653.8 |
| 72.5° | 648.3 | 656.8 | 703.7 | 753.1 | 790.9 | 801.8 | 797.0 | 781.7 | 740.9 | 672.1 | 596.5 |
| 75° | 580.7 | 588.6 | 625.8 | 681.2 | 720.8 | 728.1 | 724.5 | 706.2 | 664.8 | 597.1 | 528.9 |
| 77.5° | 506.9 | 513.6 | 545.3 | 602.0 | 631.2 | 637.3 | 639.2 | 614.8 | 575.8 | 514.9 | 453.9 |
| 80° | 407.6 | 410.7 | 453.3 | 490.5 | 516.1 | 528.3 | 527.0 | 508.8 | 469.8 | 419.2 | 358.3 |
| 82.5° | 301.0 | 303.4 | 336.3 | 368.0 | 391.2 | 402.1 | 396.0 | 377.8 | 346.7 | 303.4 | 257.1 |
| 85° | 184.6 | 180.4 | 207.2 | 230.9 | 244.9 | 252.3 | 246.2 | 235.8 | 208.4 | 174.3 | 142.0 |
| 87.5° | 66.4 | 62.8 | 74.9 | 78.6 | 94.4 | 92.0 | 97.5 | 78.6 | 63.4 | 45.1 | 31.7 |
| 90° | 29.2 | 29.2 | 28.6 | 27.4 | 25.0 | 22.5 | 21.9 | 18.3 | 13.4 | 8.5 | 3.0 |
| 92.5° | 26.8 | 26.8 | 26.2 | 25.0 | 22.5 | 20.1 | 20.1 | 16.5 | 12.2 | 7.9 | 3.0 |
| 95° | 22.5 | 22.5 | 21.9 | 20.7 | 18.9 | 17.1 | 17.1 | 13.4 | 10.4 | 6.7 | 2.4 |
| 97.5° | 17.7 | 17.7 | 17.1 | 16.5 | 14.6 | 13.4 | 13.4 | 11.0 | 7.9 | 4.9 | 1.8 |
| 100° | 13.4 | 13.4 | 12.8 | 12.2 | 11.6 | 10.4 | 9.7 | 7.9 | 6.1 | 3.7 | 1.2 |
| 102.5° | 9.7 | 9.7 | 9.7 | 9.1 | 7.9 | 7.3 | 7.3 | 6.1 | 4.3 | 3.0 | 1.2 |
| 105° | 6.7 | 6.7 | 6.7 | 6.1 | 5.5 | 4.9 | 4.9 | 4.3 | 3.0 | 1.8 | 0.6 |
| 107.5° | 4.3 | 4.3 | 4.3 | 4.3 | 3.7 | 3.0 | 3.0 | 2.4 | 1.8 | 1.2 | 0.6 |
| 110° | 2.4 | 1.8 | 2.4 | 2.4 | 2.4 | 1.8 | 1.8 | 1.2 | 1.2 | 0.6 | 0.6 |

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**CANDELA DISTRIBUTION (continued):**

| | 0° | 5° | 15° | 25° | 35° | 44° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 112.5° | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | *1.2* | 1.2 | 0.6 | 0.6 | 0.6 | 0.6 |
| 115° | 0.6 | 0.6 | 0.6 | 1.2 | 1.2 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 117.5° | 0.0 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 120° | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 122.5° | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 125° | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 127.5° | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 130° | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 132.5° | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 135° | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 137.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 140° | 0.0 | 0.6 | 0.6 | 0.0 | 0.0 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 142.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 145° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 147.5° | 0.6 | 0.6 | 0.0 | 0.0 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 150° | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 152.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 155° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 157.5° | 0.6 | 0.6 | 0.6 | 0.0 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 160° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 162.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 165° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 167.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 170° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 172.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 175° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 177.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| 180° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | *0.6* | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |

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**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 | 798.2 |
| 2.5° | 798.2 | 797.6 | 797.0 | 797.6 | 797.0 | 797.0 | 796.4 | 796.4 | 795.8 | 795.8 | 795.1 |
| 5° | 798.2 | 797.6 | 797.0 | 797.6 | 796.4 | 797.0 | 797.0 | 796.4 | 795.8 | 795.1 | 794.5 |
| 7.5° | 797.6 | 797.6 | 796.4 | 797.0 | 795.8 | 795.8 | 795.1 | 795.1 | 794.5 | 794.5 | 793.9 |
| 10° | 796.4 | 795.8 | 795.8 | 795.8 | 794.5 | 794.5 | 793.9 | 793.3 | 793.3 | 792.7 | 792.1 |
| 12.5° | 795.1 | 794.5 | 793.9 | 793.9 | 793.3 | 792.7 | 792.1 | 792.1 | 791.5 | 790.9 | 790.3 |
| 15° | 793.3 | 792.7 | 792.7 | 792.7 | 792.1 | 792.1 | 791.5 | 790.9 | 789.7 | 789.0 | 788.4 |
| 17.5° | 792.7 | 792.1 | 792.7 | 792.7 | 792.1 | 792.7 | 791.5 | 790.3 | 789.0 | 788.4 | 787.8 |
| 20° | 792.1 | 792.1 | 792.1 | 791.5 | 790.9 | 790.3 | 789.7 | 789.0 | 788.4 | 787.8 | 787.2 |
| 22.5° | 789.0 | 788.4 | 787.2 | 783.6 | 779.3 | 776.3 | 775.6 | 776.9 | 776.9 | 776.9 | 775.0 |
| 25° | 783.6 | 781.7 | 776.9 | 770.2 | 762.8 | 758.0 | 754.9 | 754.9 | 754.3 | 753.1 | 752.5 |
| 27.5° | 776.9 | 773.2 | 764.7 | 756.1 | 745.8 | 739.7 | 732.4 | 728.1 | 726.3 | 725.7 | 724.5 |
| 30° | 767.7 | 762.2 | 751.3 | 740.3 | 727.5 | 719.0 | 707.4 | 700.1 | 695.8 | 694.0 | 692.8 |
| 32.5° | 756.8 | 751.3 | 738.5 | 725.1 | 709.8 | 697.7 | 683.0 | 671.5 | 663.5 | 659.9 | 658.0 |
| 35° | 749.4 | 741.5 | 726.9 | 711.1 | 695.8 | 678.2 | 660.5 | 644.6 | 632.5 | 628.2 | 625.8 |
| 37.5° | 746.4 | 739.1 | 723.2 | 707.4 | 690.3 | 669.0 | 648.3 | 625.8 | 609.3 | 602.0 | 599.6 |
| 40° | 748.2 | 739.1 | 721.4 | 704.4 | 684.2 | 660.5 | 633.1 | 605.0 | 583.7 | 573.4 | 570.9 |
| 42.5° | 744.0 | 733.6 | 712.9 | 694.6 | 669.6 | 642.8 | 609.3 | 577.0 | 548.4 | 539.8 | 536.2 |
| 45° | 736.6 | 723.9 | 701.3 | 678.2 | 652.0 | 619.1 | 584.3 | 542.9 | 508.8 | 498.4 | 495.4 |
| 47.5° | 729.3 | 711.7 | 684.9 | 663.5 | 631.8 | 593.5 | 552.6 | 506.3 | 463.7 | 453.3 | 451.5 |
| 50° | 718.4 | 701.9 | 673.3 | 648.3 | 616.0 | 571.5 | 525.2 | 467.3 | 419.2 | 401.5 | 396.7 |
| 52.5° | 713.5 | 692.2 | 664.8 | 645.3 | 606.3 | 555.7 | 497.2 | 435.0 | 365.6 | 343.6 | 338.8 |
| 55° | 718.4 | 691.6 | 662.3 | 643.4 | 598.3 | 535.6 | 463.7 | 384.5 | 304.0 | 280.9 | 274.2 |
| 57.5° | 709.8 | 686.7 | 657.4 | 636.1 | 577.6 | 494.1 | 414.9 | 313.2 | 229.7 | 199.9 | 197.4 |
| 60° | 698.9 | 666.0 | 638.6 | 619.1 | 534.4 | 416.2 | 322.9 | 223.0 | 138.3 | 112.7 | 107.8 |
| 62.5° | 694.6 | 660.5 | 628.8 | 605.0 | 476.5 | 305.9 | 196.8 | 112.7 | 57.3 | 40.2 | 36.6 |
| 65° | *681.2* | *650.7* | *628.2* | *594.7* | *416.2* | *188.9* | *84.7* | *33.5* | *2.4* | *1.8* | *1.8* |
| 67.5° | 655.6 | 624.5 | 609.3 | 589.8 | 410.1 | 180.4 | 76.8 | 30.5 | 1.2 | 0.0 | 0.0 |
| 70° | 611.7 | 587.4 | 577.0 | 566.7 | 392.4 | 166.9 | 70.1 | 27.4 | 0.6 | 0.0 | 0.0 |
| 72.5° | 553.9 | 537.4 | 535.6 | 534.4 | 366.8 | 154.2 | 62.8 | 24.4 | 0.6 | 0.0 | 0.0 |
| 75° | 496.0 | 475.9 | 478.9 | 486.2 | 335.1 | 136.5 | 54.2 | 21.3 | 0.6 | 0.0 | 0.0 |
| 77.5° | 422.9 | 408.2 | 415.5 | 427.7 | 293.7 | 115.8 | 44.5 | 17.1 | 0.6 | 0.0 | 0.0 |
| 80° | 332.7 | 322.9 | 339.4 | 350.3 | 240.1 | 92.0 | 33.5 | 12.2 | 0.0 | 0.0 | 0.0 |
| 82.5° | 236.4 | 230.9 | 246.2 | 260.2 | 178.5 | 65.2 | 23.2 | 7.9 | 0.0 | 0.0 | 0.0 |
| 85° | 127.3 | 124.3 | 138.9 | 154.2 | 107.2 | 37.2 | 11.6 | 3.7 | 0.0 | 0.0 | 0.0 |
| 87.5° | 31.7 | 29.2 | 29.9 | 35.9 | 26.2 | 7.9 | 1.8 | 0.6 | 0.0 | 0.0 | 0.0 |
| 90° | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 92.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 95° | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 97.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 100° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 102.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 105° | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 107.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 110° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

REPORT NUMBER: P821268
CATALOG NUMBER: TT-D1-740-24VDC-MQ-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 112.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 115° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 117.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 120° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 122.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 125° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 127.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 130° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 132.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 135° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 137.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 140° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 142.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 145° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 147.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 150° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 152.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 155° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 157.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 160° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 162.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 165° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 167.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 170° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 172.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 175° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 177.5° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 180° | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

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

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-176-5

Test Date: 09/24/2024

Luminaire Tested: MEM2-HTN-VA-30-740-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-30-740-U-WQ

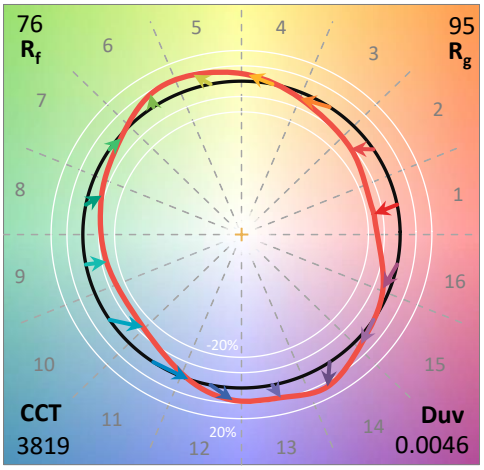
Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-176-5 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 09/27/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Streetworks |
| Catalog Number: | **MEM2-HTN-VA-30-740-U-WQ** |
| Description: | EPIC MODERN VISUAL COMFORT 30W WAVESTREAM WIDE |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3819 | CRI (Ra): | 72.9 | | |
| CIE u': | 0.2261 | R1: | 70.1 | R9: | -21.5 |
| CIE v': | 0.5108 | R2: | 78.4 | R10: | 48.5 |
| Duv: | 0.0046 | R3: | 85.0 | R11: | 68.4 |
| CIE x: | 0.3926 | R4: | 72.9 | R12: | 39.0 |
| CIE y: | 0.3942 | R5: | 69.1 | R13: | 71.1 |
| CIE z: | 0.2132 | R6: | 69.2 | R14: | 91.3 |
| Peak Wavelength (nm): | 450 | R7: | 82.8 | R15: | 63.2 |
| Dominant Wavelength (nm): | 577 | R8: | 55.4 | | |
| Purity: | 36.15483 | | | | |
| Rf: | 75.6 | | | | |
| Rg: | 94.8 | | | | |




## Test Conditions

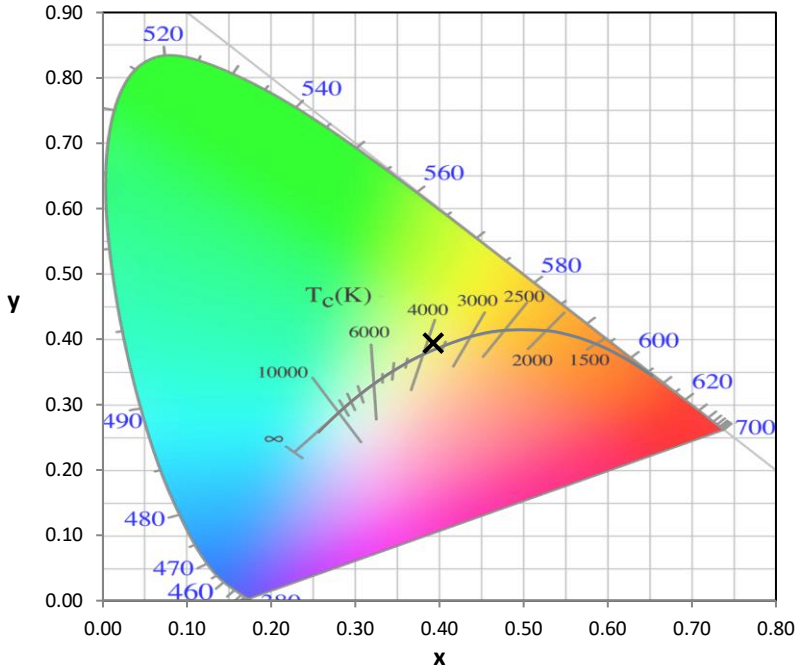
| | |
|---|---|
| Stabilization Time: | 30M |
| Operation Time: | 1H 30M |
| Sphere Temperature (°C): | 25.2 |

REPORT NUMBER: SP1-2407-176-5

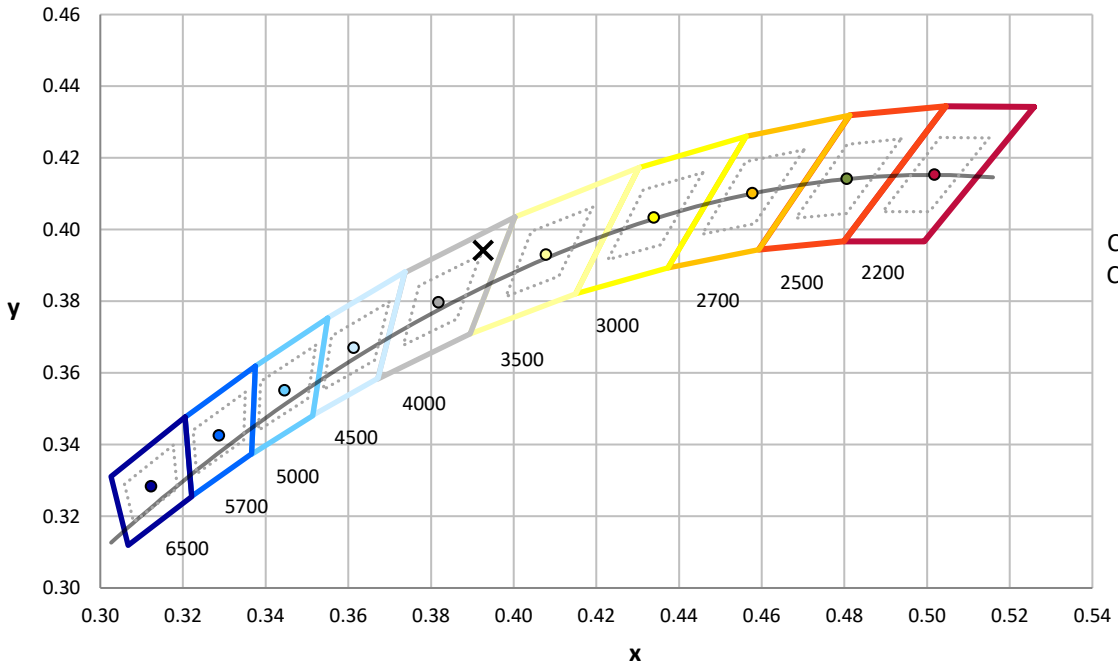
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC 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: SP1-2407-176-5

## CIE 1931 Chromaticity Diagram




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

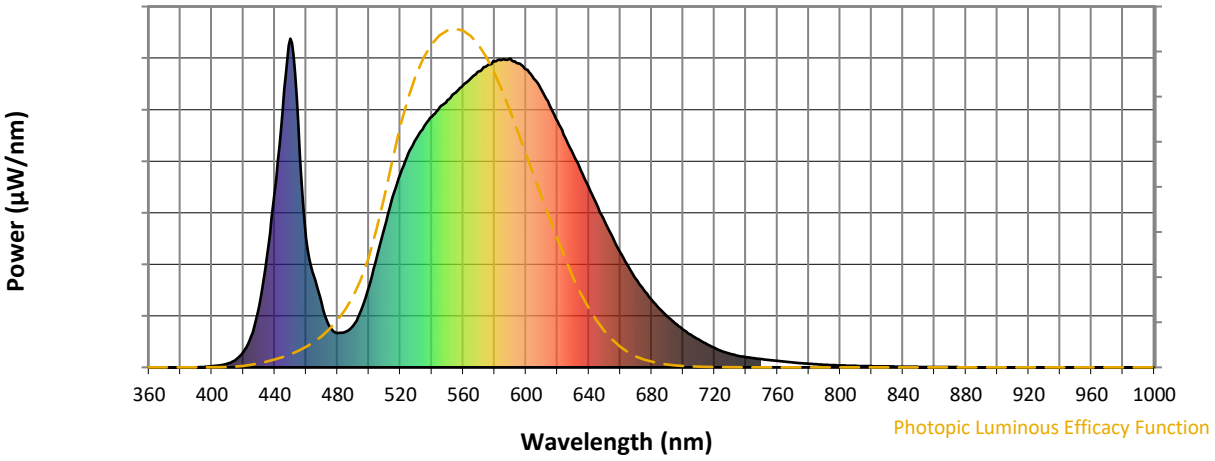



CCT = 3819K
CIE x = 0.3926
CIE y = 0.3942
Duv = 0.0046

Point lies inside the ANSI 4000K 7-step quadrangle

REPORT NUMBER: SP1-2407-176-5

## Photopic Flux vs. Wavelength

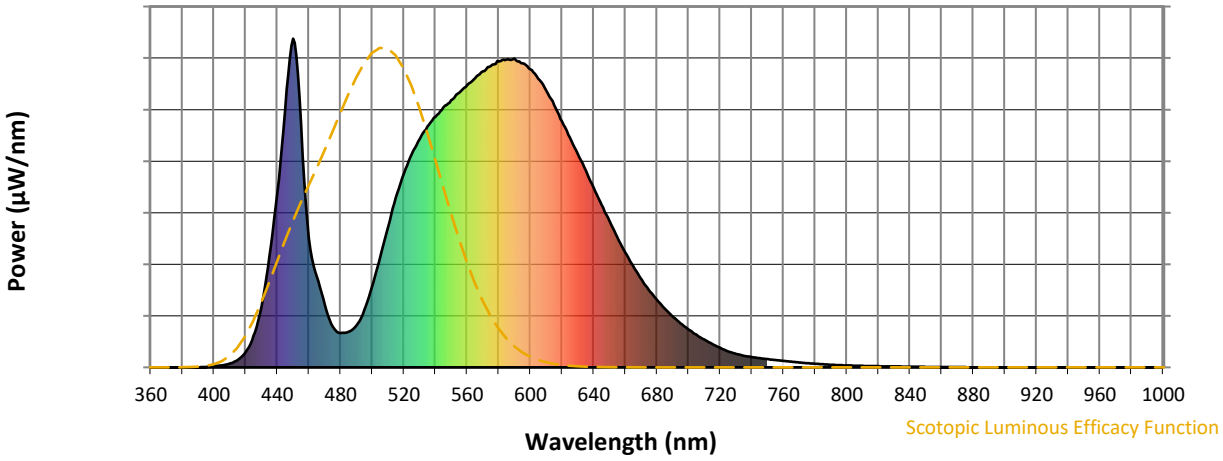



## Photopic Lumens: NR

| 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 | 127 | NR | 620 | 748 | NR | 750 | 25 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 173 | NR | 625 | 699 | NR | 755 | 22 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 246 | NR | 630 | 648 | NR | 760 | 20 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 335 | NR | 635 | 599 | NR | 765 | 17 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 427 | NR | 640 | 547 | NR | 770 | 15 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 517 | NR | 645 | 495 | NR | 775 | 13 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 589 | NR | 650 | 445 | NR | 780 | 11 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 649 | NR | 655 | 396 | NR | 785 | 9 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 695 | NR | 660 | 349 | NR | 790 | 8 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 733 | NR | 665 | 308 | NR | 795 | 7 | NR | 925 | 0 | NR |
| 410 | 11 | NR | 540 | 763 | NR | 670 | 269 | NR | 800 | 6 | NR | 930 | 0 | NR |
| 415 | 23 | NR | 545 | 792 | NR | 675 | 235 | NR | 805 | 5 | NR | 935 | 0 | NR |
| 420 | 46 | NR | 550 | 813 | NR | 680 | 205 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 95 | NR | 555 | 835 | NR | 685 | 178 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 183 | NR | 560 | 859 | NR | 690 | 155 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 338 | NR | 565 | 880 | NR | 695 | 134 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 534 | NR | 570 | 900 | NR | 700 | 115 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 782 | NR | 575 | 918 | NR | 705 | 99 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 931 | NR | 710 | 84 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 739 | NR | 585 | 937 | NR | 715 | 71 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 393 | NR | 590 | 939 | NR | 720 | 59 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 276 | NR | 595 | 925 | NR | 725 | 49 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 190 | NR | 600 | 907 | NR | 730 | 41 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 123 | NR | 605 | 878 | NR | 735 | 35 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 105 | NR | 610 | 842 | NR | 740 | 31 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 108 | NR | 615 | 797 | NR | 745 | 28 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-176-5

## Scotopic Flux vs. Wavelength

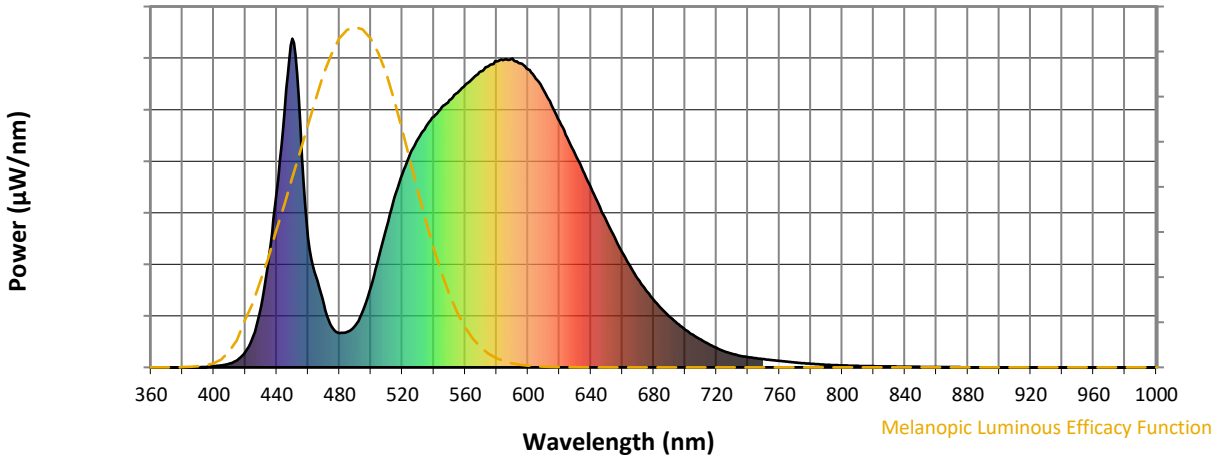



**Scotopic Lumens: NR** **S/P: 1.45**

| 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 | 127 | NR | 620 | 748 | NR | 750 | 25 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 173 | NR | 625 | 699 | NR | 755 | 22 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 246 | NR | 630 | 648 | NR | 760 | 20 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 335 | NR | 635 | 599 | NR | 765 | 17 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 427 | NR | 640 | 547 | NR | 770 | 15 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 517 | NR | 645 | 495 | NR | 775 | 13 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 589 | NR | 650 | 445 | NR | 780 | 11 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 649 | NR | 655 | 396 | NR | 785 | 9 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 695 | NR | 660 | 349 | NR | 790 | 8 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 733 | NR | 665 | 308 | NR | 795 | 7 | NR | 925 | 0 | NR |
| 410 | 11 | NR | 540 | 763 | NR | 670 | 269 | NR | 800 | 6 | NR | 930 | 0 | NR |
| 415 | 23 | NR | 545 | 792 | NR | 675 | 235 | NR | 805 | 5 | NR | 935 | 0 | NR |
| 420 | 46 | NR | 550 | 813 | NR | 680 | 205 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 95 | NR | 555 | 835 | NR | 685 | 178 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 183 | NR | 560 | 859 | NR | 690 | 155 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 338 | NR | 565 | 880 | NR | 695 | 134 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 534 | NR | 570 | 900 | NR | 700 | 115 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 782 | NR | 575 | 918 | NR | 705 | 99 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 931 | NR | 710 | 84 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 739 | NR | 585 | 937 | NR | 715 | 71 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 393 | NR | 590 | 939 | NR | 720 | 59 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 276 | NR | 595 | 925 | NR | 725 | 49 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 190 | NR | 600 | 907 | NR | 730 | 41 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 123 | NR | 605 | 878 | NR | 735 | 35 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 105 | NR | 610 | 842 | NR | 740 | 31 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 108 | NR | 615 | 797 | NR | 745 | 28 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-176-5

## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.76**

| 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 | 127 | NR | 620 | 748 | NR | 750 | 25 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 173 | NR | 625 | 699 | NR | 755 | 22 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 246 | NR | 630 | 648 | NR | 760 | 20 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 335 | NR | 635 | 599 | NR | 765 | 17 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 427 | NR | 640 | 547 | NR | 770 | 15 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 517 | NR | 645 | 495 | NR | 775 | 13 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 589 | NR | 650 | 445 | NR | 780 | 11 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 649 | NR | 655 | 396 | NR | 785 | 9 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 695 | NR | 660 | 349 | NR | 790 | 8 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 733 | NR | 665 | 308 | NR | 795 | 7 | NR | 925 | 0 | NR |
| 410 | 11 | NR | 540 | 763 | NR | 670 | 269 | NR | 800 | 6 | NR | 930 | 0 | NR |
| 415 | 23 | NR | 545 | 792 | NR | 675 | 235 | NR | 805 | 5 | NR | 935 | 0 | NR |
| 420 | 46 | NR | 550 | 813 | NR | 680 | 205 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 95 | NR | 555 | 835 | NR | 685 | 178 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 183 | NR | 560 | 859 | NR | 690 | 155 | NR | 820 | 3 | NR | 950 | 0 | NR |
| 435 | 338 | NR | 565 | 880 | NR | 695 | 134 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 534 | NR | 570 | 900 | NR | 700 | 115 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 782 | NR | 575 | 918 | NR | 705 | 99 | NR | 835 | 2 | NR | 965 | 0 | NR |
| 450 | 1000 | NR | 580 | 931 | NR | 710 | 84 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 739 | NR | 585 | 937 | NR | 715 | 71 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 393 | NR | 590 | 939 | NR | 720 | 59 | NR | 850 | 1 | NR | 980 | 0 | NR |
| 465 | 276 | NR | 595 | 925 | NR | 725 | 49 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 190 | NR | 600 | 907 | NR | 730 | 41 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 123 | NR | 605 | 878 | NR | 735 | 35 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 105 | NR | 610 | 842 | NR | 740 | 31 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 108 | NR | 615 | 797 | NR | 745 | 28 | NR | 875 | 1 | NR | | | |

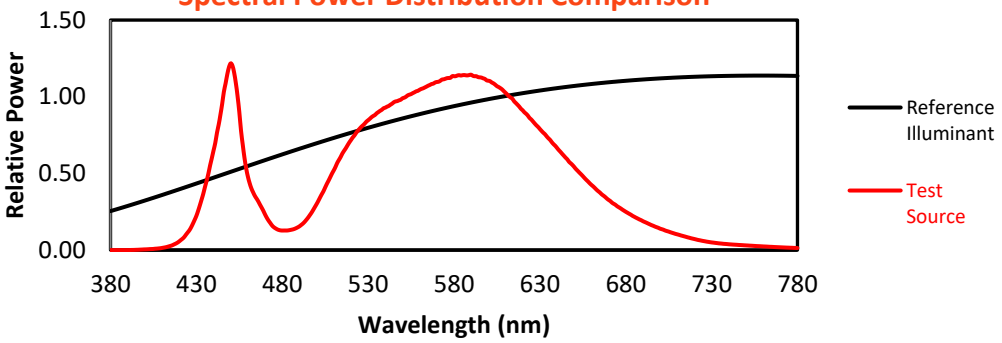
REPORT NUMBER: SP1-2407-176-5

# TM-30-18

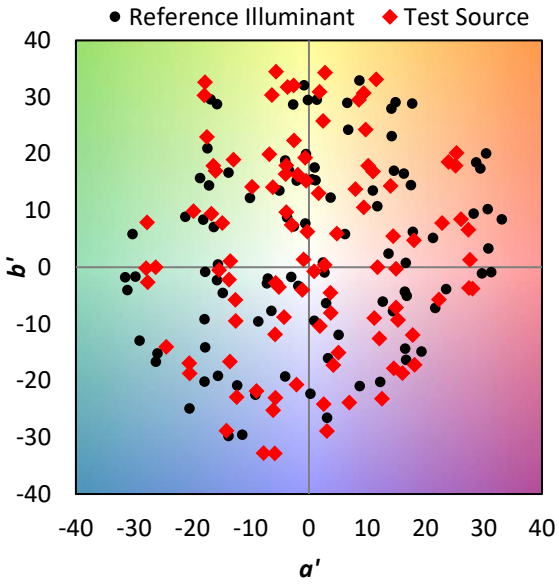
## Summary

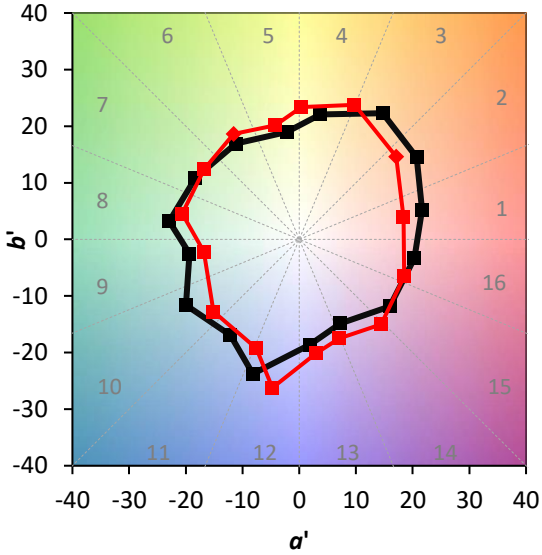
$R_f$ = 75.6
$R_g$ = 94.8
CIE $R_a$ = 72.9
$R_9$ = -21.5

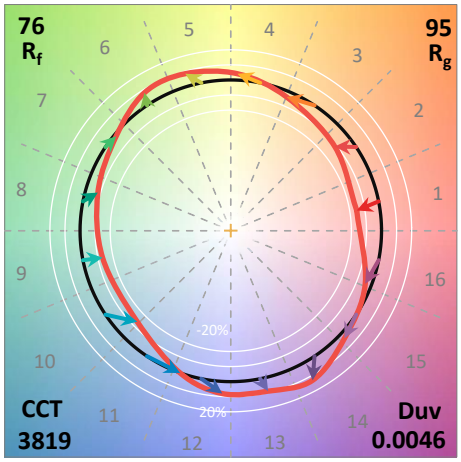
## Spectral Power Distribution Comparison

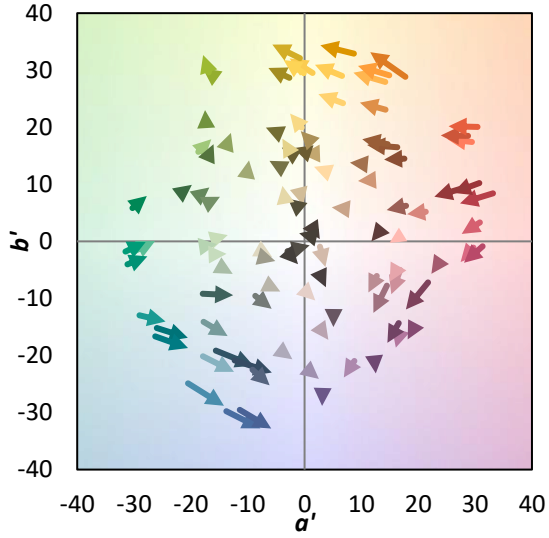



## Color Vector Graphics



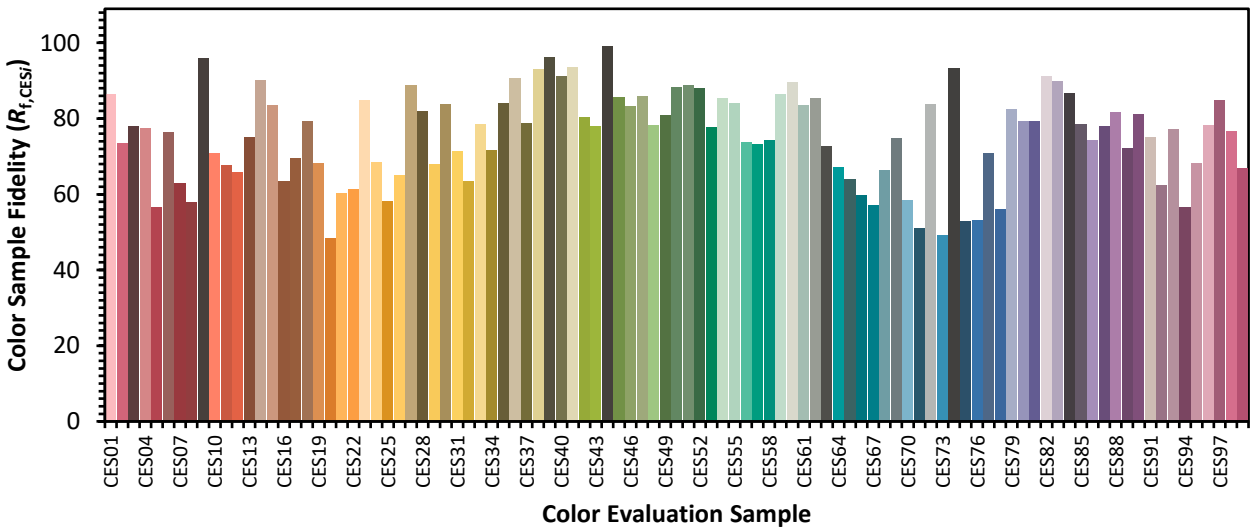



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**Individual Sample Fidelity Index ($R_{f,i}$)**

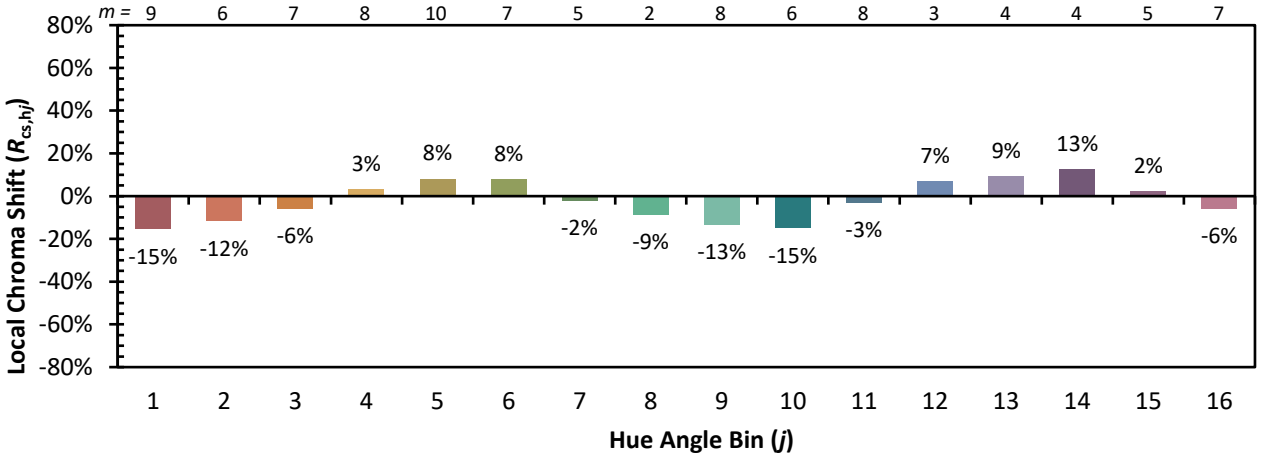
| | | | |
|---|---|---|---|
| CES01 = 85 | CES26 = 65 | CES51 = 89 | CES76 = 53 |
| CES02 = 61 | CES27 = 89 | CES52 = 88 | CES77 = 71 |
| CES03 = 30 | CES28 = 82 | CES53 = 78 | CES78 = 56 |
| CES04 = 70 | CES29 = 68 | CES54 = 85 | CES79 = 83 |
| CES05 = 48 | CES30 = 84 | CES55 = 84 | CES80 = 79 |
| CES06 = 50 | CES31 = 71 | CES56 = 74 | CES81 = 79 |
| CES07 = 40 | CES32 = 63 | CES57 = 73 | CES82 = 91 |
| CES08 = 39 | CES33 = 79 | CES58 = 74 | CES83 = 90 |
| CES09 = 29 | CES34 = 72 | CES59 = 86 | CES84 = 87 |
| CES10 = 74 | CES35 = 84 | CES60 = 90 | CES85 = 78 |
| CES11 = 57 | CES36 = 91 | CES61 = 84 | CES86 = 74 |
| CES12 = 63 | CES37 = 79 | CES62 = 85 | CES87 = 78 |
| CES13 = 42 | CES38 = 93 | CES63 = 73 | CES88 = 82 |
| CES14 = 74 | CES39 = 96 | CES64 = 67 | CES89 = 72 |
| CES15 = 71 | CES40 = 91 | CES65 = 64 | CES90 = 81 |
| CES16 = 47 | CES41 = 93 | CES66 = 60 | CES91 = 75 |
| CES17 = 49 | CES42 = 80 | CES67 = 57 | CES92 = 62 |
| CES18 = 56 | CES43 = 78 | CES68 = 66 | CES93 = 77 |
| CES19 = 72 | CES44 = 99 | CES69 = 75 | CES94 = 57 |
| CES20 = 65 | CES45 = 86 | CES70 = 58 | CES95 = 68 |
| CES21 = 86 | CES46 = 83 | CES71 = 51 | CES96 = 78 |
| CES22 = 78 | CES47 = 86 | CES72 = 84 | CES97 = 85 |
| CES23 = 92 | CES48 = 78 | CES73 = 49 | CES98 = 77 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 67 |
| CES25 = 72 | CES50 = 88 | CES75 = 53 | |

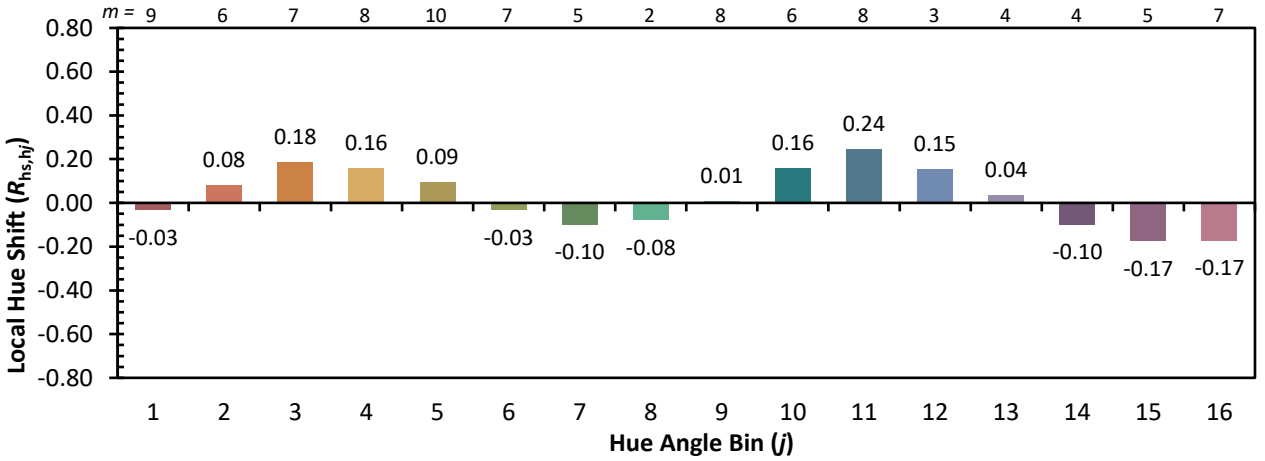


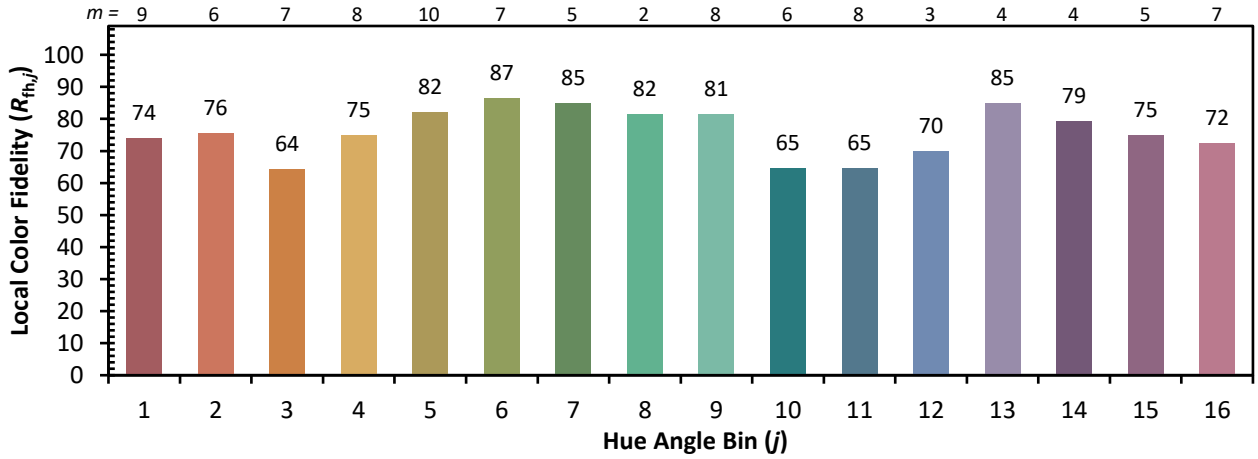
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## Color Rendition by Hue-Angle Bin



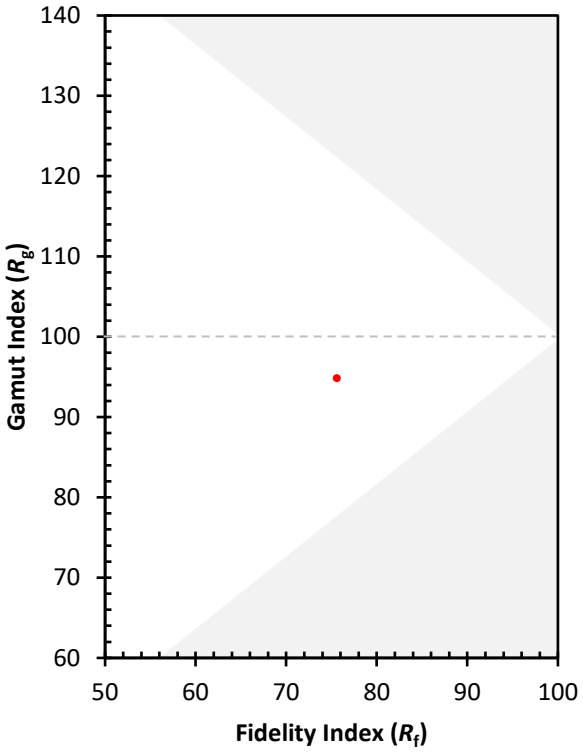



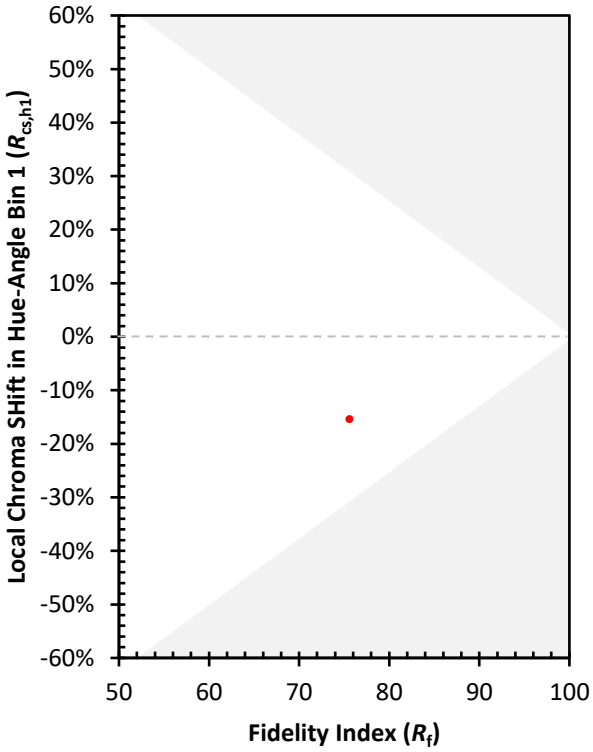



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## Measure Comparisons




(END OF REPORT)