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: P1438048

Luminaire Tested: **GALN-SB3D-722-U-T4LG-HSS**

Issue Date: 03/27/202

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been influenced by sources from within Cooper Lighting Solutions or from external interests.

Report Generated By 670245763

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P1438048 |
| Test Lab: | INNOVATION CENTER(G1) |
| Issue Date: | 03/27/202 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GALN-SB3D-722-U-T4LG-HSS |
| Description: | GALLEON II AREA AND ROADWAY HIGH DENSITY LUMINAIRE 900mA 3xLight Square PACKAGE 70CRI 2200K FIXTURE w/ TYPE IV LOW GLARE WITH HOUSE SIDE SHIELD |
| Light Source: | (78) 2200K CCT, 70 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

Luminaire Equipment:

| Sample No. | Condition | Description |
|---|---|---|
| a | good | reflector |
| b | good | lens |
| c | good | housing |
| d | good | cord |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 18293.1 lumens |
| Efficiency: | N/A |
| Efficacy: | 83.9 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 1' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B1 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 218.1 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | 0.97 |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

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Scaled Data Report

REPORT NUMBER: P1438048
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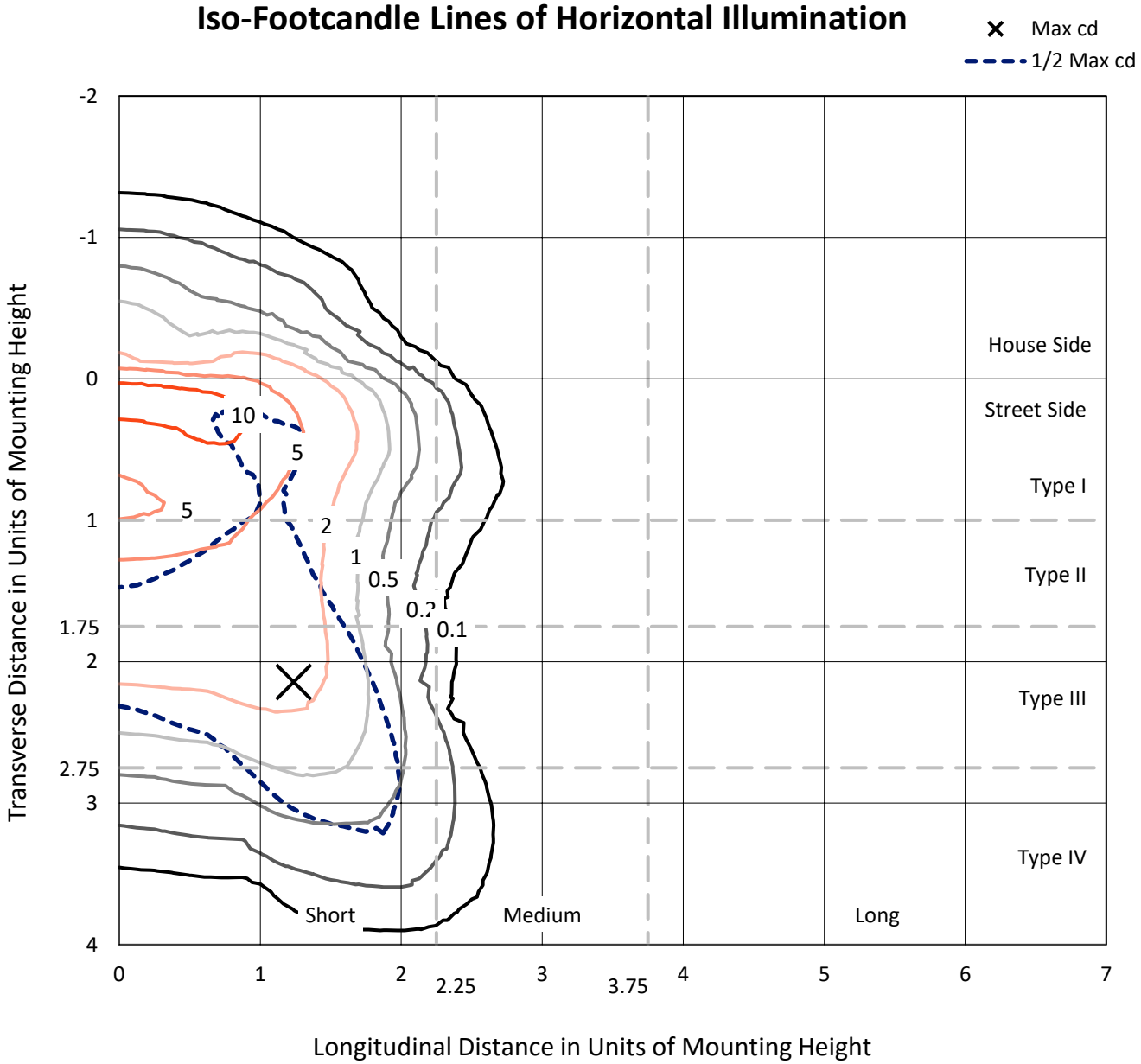
## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 13.8 fc
Type IV - Short - N/A

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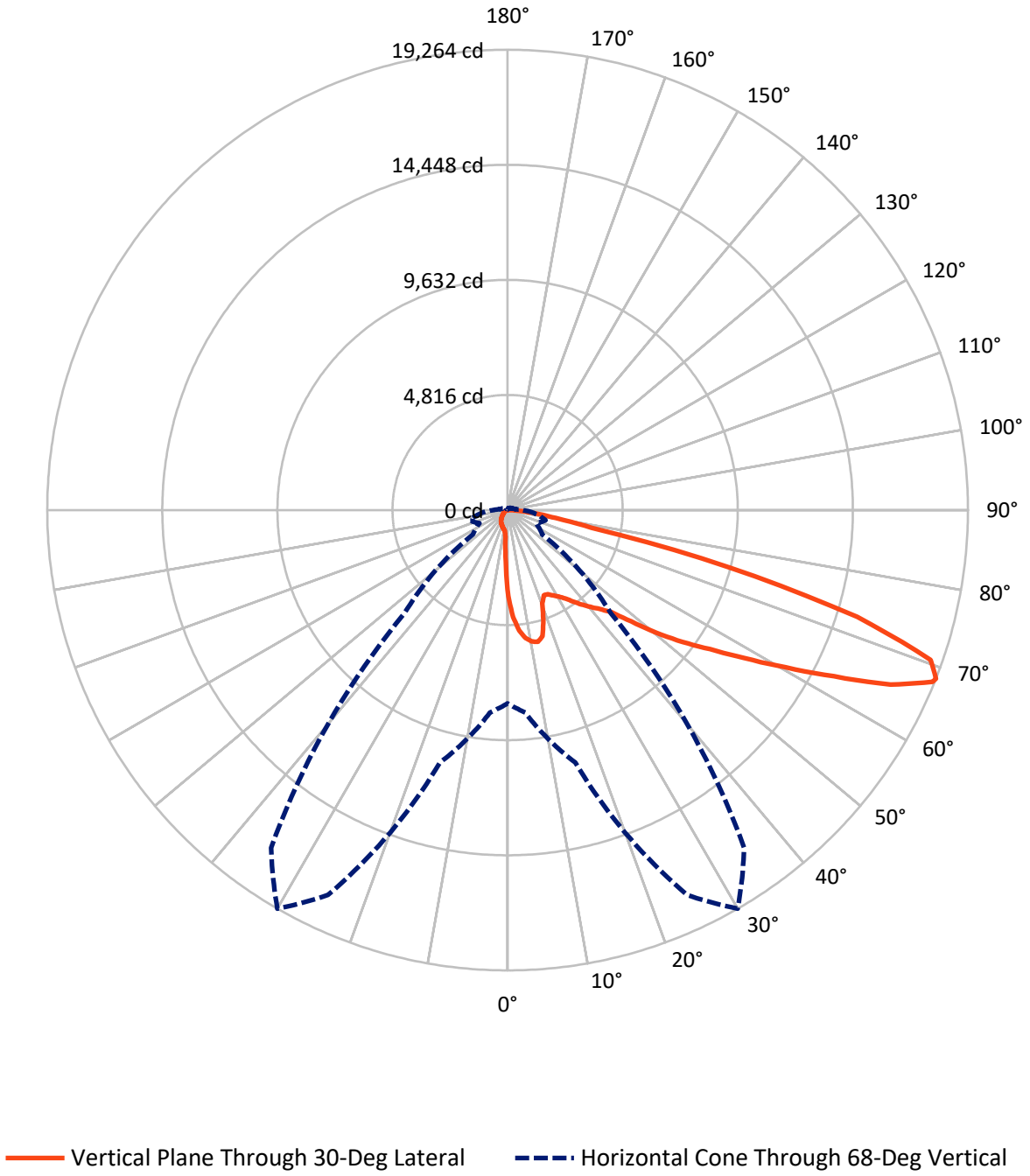
## Luminous Intensity Polar Plot



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REPORT NUMBER: P1438048
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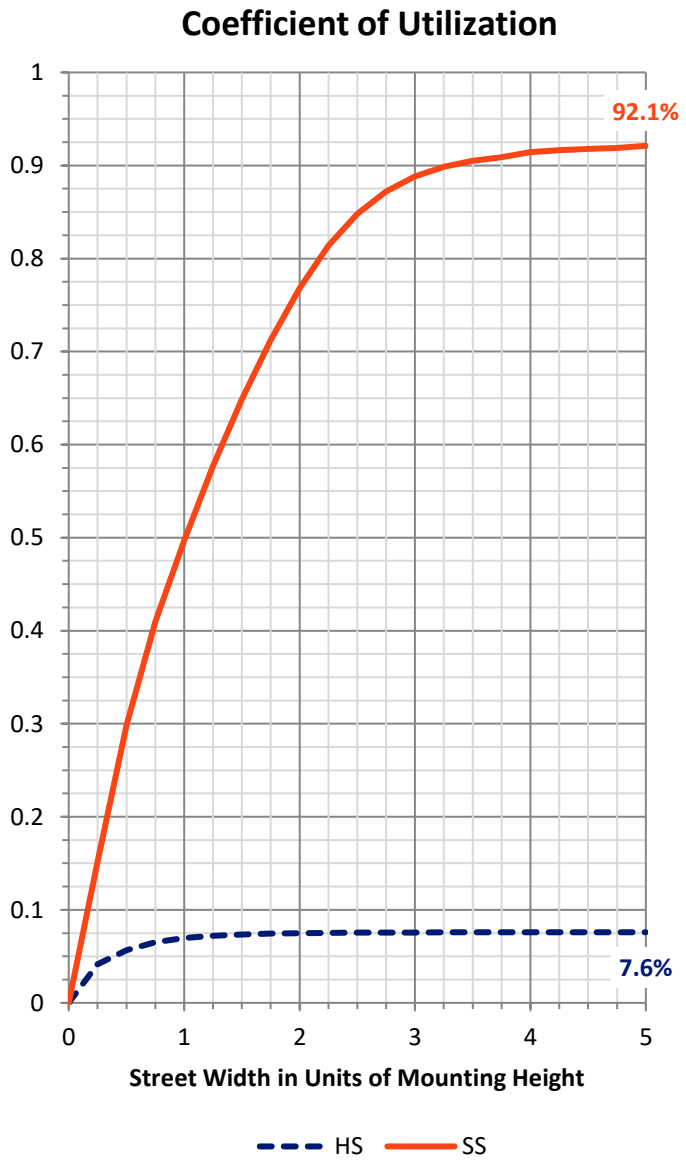
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1396.2 | 0.0 | 1396.2 |
| | % Fixture | 7.6 | 0.0 | 7.6 |
| **Street Side** | Lumens | 16896.9 | 0.0 | 16896.9 |
| | % Fixture | 92.4 | 0.0 | 92.4 |
| **Total** | Lumens | 18293.1 | 0.0 | 18293.1 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 311.3 | 1.7 |
| 10°-20° | 888.6 | 4.9 |
| 20°-30° | 1396.4 | 7.6 |
| 30°-40° | 2190.2 | 12.0 |
| 40°-50° | 3273.7 | 17.9 |
| 50°-60° | 4355.1 | 23.8 |
| 60°-70° | 4210.0 | 23.0 |
| 70°-80° | 1513.3 | 8.3 |
| 80°-90° | 154.4 | 0.8 |
| 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° | 18293.1 | 100.0 |
| 0°-180° | 18293.1 | 100.0 |



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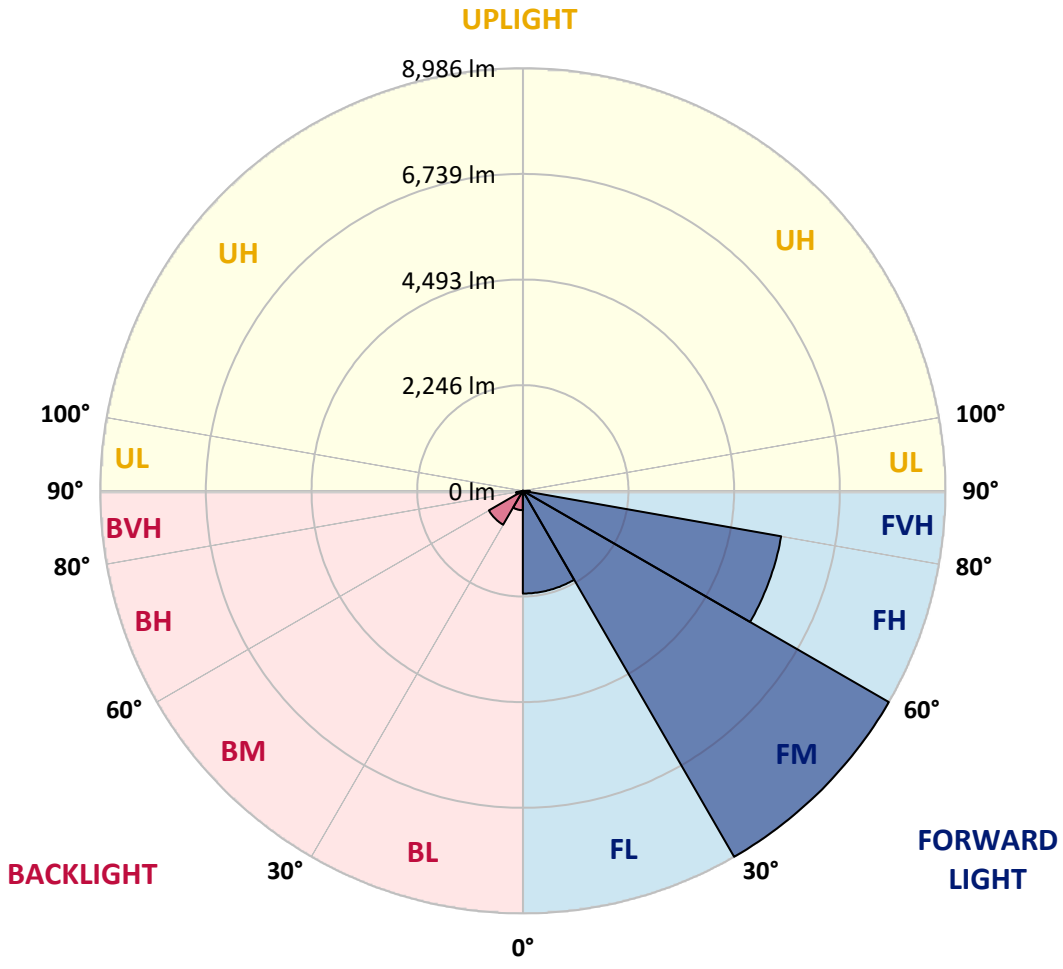
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 2184.2 | 11.9 | | | |
| FM | (30°-60°) | 8985.6 | 49.1 | | | |
| FH | (60°-80°) | 5578.1 | 30.5 | | | G3/7500 |
| FVH | (80°-90°) | 149.0 | 0.8 | | | G2/225 |
| BL | (0°-30°) | 412.1 | 2.3 | B1/500 | | |
| BM | (30°-60°) | 833.4 | 4.6 | B1/1000 | | |
| BH | (60°-80°) | 145.2 | 0.8 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 5.5 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G3**
Type IV Short



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REPORT NUMBER: P1438048
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 30° | 35° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3607.2 | 3607.2 | 3607.2 | 3607.2 | *3607.2* | 3607.2 | 3607.2 | 3607.2 | 3607.2 | 3607.2 | 3607.2 |
| 2.5° | 4610.4 | 4610.4 | 4577.5 | 4533.6 | *4484.3* | 4467.9 | 4374.7 | 4243.1 | 4106.1 | 3947.1 | 3716.8 |
| 5° | 5202.5 | 5197.0 | 5131.2 | 5131.2 | *5065.4* | 5005.1 | 4911.9 | 4720.0 | 4500.8 | 4215.7 | 3815.5 |
| 7.5° | 5465.6 | 5476.6 | 5449.2 | 5449.2 | *5410.8* | 5366.9 | 5312.1 | 5125.7 | 4868.1 | 4484.3 | 3914.2 |
| 10° | 5558.8 | 5564.3 | 5564.3 | 5602.6 | *5591.7* | 5586.2 | 5580.7 | 5476.6 | 5207.9 | 4758.4 | 4018.3 |
| 12.5° | 5334.0 | 5361.4 | 5438.2 | 5608.1 | *5663.0* | 5723.3 | 5805.5 | 5772.6 | 5586.2 | 5103.8 | 4177.3 |
| 15° | 4610.4 | 4615.9 | 4829.7 | 5251.8 | *5476.6* | 5706.8 | 6024.8 | 6090.5 | 5969.9 | 5476.6 | 4341.8 |
| 17.5° | 3804.5 | 3821.0 | 3990.9 | 4462.4 | *4824.2* | 5356.0 | 6150.9 | 6419.5 | 6375.6 | 5843.9 | 4495.3 |
| 20° | 3470.1 | 3492.1 | 3574.3 | 3870.3 | *4144.4* | 4637.8 | 6024.8 | 6731.9 | 6748.4 | 6211.2 | 4637.8 |
| 22.5° | 3393.4 | 3409.8 | 3475.6 | 3705.9 | *3875.8* | 4204.7 | 5597.2 | 6978.6 | 7170.5 | 6633.3 | 4807.8 |
| 25° | 3371.5 | 3387.9 | 3486.6 | 3738.8 | *3897.7* | 4171.8 | 5207.9 | 7110.2 | 7669.4 | 7071.8 | 4972.2 |
| 27.5° | 3355.0 | 3376.9 | 3535.9 | 3859.4 | *4045.7* | 4308.9 | 5136.7 | 7137.6 | 8146.3 | 7537.8 | 5240.8 |
| 30° | 3376.9 | 3409.8 | 3618.1 | 3985.4 | *4199.2* | 4495.3 | 5306.6 | 7165.0 | 8672.6 | 8069.6 | 5580.7 |
| 32.5° | 3464.7 | 3492.1 | 3744.2 | 4155.4 | *4402.1* | 4736.5 | 5597.2 | 7329.5 | 9171.5 | 8612.3 | 5904.2 |
| 35° | 3563.3 | 3601.7 | 3903.2 | 4396.6 | *4692.6* | 5070.9 | 5991.9 | 7652.9 | 9648.4 | 9127.6 | 6238.6 |
| 37.5° | 3683.9 | 3727.8 | 4089.6 | 4670.7 | *5010.6* | 5438.2 | 6419.5 | 8102.5 | 10070.5 | 9549.7 | 6573.0 |
| 40° | 3848.4 | 3897.7 | 4303.4 | 4961.2 | *5328.5* | 5756.1 | 6841.6 | 8546.5 | 10394.0 | 9801.9 | 6792.3 |
| 42.5° | 4495.3 | 4561.1 | 4731.0 | 5246.3 | *5657.5* | 6096.0 | 7258.2 | 8968.6 | 10514.6 | 9884.1 | 6836.1 |
| 45° | 5701.3 | 5767.1 | 5723.3 | 5821.9 | *6096.0* | 6507.2 | 7713.2 | 9374.3 | 10531.0 | 9862.2 | 6814.2 |
| 47.5° | 6912.9 | 6989.6 | 6951.2 | 6896.4 | *6956.7* | 7154.1 | 8223.1 | 9631.9 | 10443.3 | 9851.2 | 6814.2 |
| 50° | 8069.6 | 8025.7 | 8031.2 | 8014.7 | *8069.6* | 8173.7 | 8716.4 | 9681.3 | 10421.4 | 9955.4 | 6874.5 |
| 52.5° | 8689.0 | 8711.0 | 8848.0 | 9050.9 | *9171.5* | 9275.6 | 9281.1 | 9758.0 | 10262.4 | 9780.0 | 6803.2 |
| 55° | 9297.5 | 9341.4 | 9659.4 | 10004.7 | *10273.3* | 10470.7 | 9845.7 | 9708.7 | 9314.0 | 9193.4 | 6430.4 |
| 57.5° | 9982.8 | 10043.1 | 10492.6 | 11205.3 | *11676.8* | 11780.9 | 10404.9 | 8787.7 | 7883.2 | 8354.6 | 5706.8 |
| 60° | 10925.7 | 10997.0 | 11594.5 | 12663.5 | *13365.2* | 13151.4 | 10448.8 | 7324.0 | 6260.5 | 6934.8 | 4709.1 |
| 62.5° | 11665.8 | 11808.3 | 12888.3 | 14554.8 | *15327.8* | 14648.0 | 9631.9 | 5613.6 | 4374.7 | 4873.5 | 3437.2 |
| 65° | 10876.4 | 11150.5 | 12910.2 | 16720.2 | *17613.8* | 16407.8 | 8349.2 | 3831.9 | 2466.9 | 3152.2 | 2198.3 |
| 67.5° | 8793.2 | 9176.9 | 11463.0 | 17772.8 | *19181.7* | 17334.2 | 6573.0 | 2033.8 | 1414.4 | 1831.0 | 1156.7 |
| 68° | *8091.5* | *8508.1* | *10931.2* | *17772.8* | *19263.9* | *17252.0* | *6101.5* | *1759.7* | *1304.7* | *1644.6* | *1003.2* |
| 70° | 5591.7 | 5887.7 | 8404.0 | 16775.1 | *18781.5* | 15728.0 | 4018.3 | 1008.7 | 981.3 | 1129.3 | 663.3 |
| 72.5° | 2741.0 | 3059.0 | 4495.3 | 13294.0 | *15300.4* | 12087.9 | 1831.0 | 668.8 | 745.6 | 827.8 | 520.8 |
| 75° | 1090.9 | 1156.7 | 1770.7 | 6556.5 | *9560.7* | 7713.2 | 959.4 | 504.3 | 641.4 | 646.9 | 411.2 |
| 77.5° | 625.0 | 663.3 | 981.3 | 2412.1 | *3585.3* | 3448.2 | 619.5 | 361.8 | 509.8 | 466.0 | 268.6 |
| 80° | 350.9 | 356.3 | 553.7 | 1271.8 | *2050.3* | 1836.5 | 422.1 | 263.1 | 389.2 | 328.9 | 180.9 |
| 82.5° | 175.4 | 197.4 | 350.9 | 701.7 | *1140.3* | 1167.7 | 224.8 | 186.4 | 312.5 | 235.7 | 148.0 |
| 85° | 126.1 | 137.1 | 252.2 | 389.2 | *526.3* | 789.4 | 137.1 | 93.2 | 235.7 | 159.0 | 104.2 |
| 87.5° | 65.8 | 82.2 | 159.0 | 191.9 | *213.8* | 268.6 | 65.8 | 43.9 | 131.6 | 93.2 | 54.8 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
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Scaled Data Report

REPORT NUMBER: P1438048
CATALOG NUMBER: GALN-SB3D-722-U-T4LG-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3607.2 | 3607.2 | 3607.2 | 3607.2 | 3607.2 | 3607.2 | 3607.2 | 3607.2 | 3607.2 | 3607.2 | 3607.2 |
| 2.5° | 3607.2 | 3481.1 | 3223.4 | 2921.9 | 2686.2 | 2445.0 | 2247.6 | 2061.2 | 1973.5 | 1962.6 | 1984.5 |
| 5° | 3590.7 | 3316.6 | 2730.1 | 2154.4 | 1683.0 | 1354.1 | 1173.2 | 1080.0 | 1030.6 | 1008.7 | 1014.2 |
| 7.5° | 3557.8 | 3141.2 | 2203.8 | 1458.2 | 1090.9 | 948.4 | 904.5 | 888.1 | 882.6 | 882.6 | 882.6 |
| 10° | 3525.0 | 2905.5 | 1688.5 | 1069.0 | 893.6 | 855.2 | 844.2 | 844.2 | 838.8 | 838.8 | 844.2 |
| 12.5° | 3508.5 | 2686.2 | 1310.2 | 893.6 | 833.3 | 816.8 | 805.9 | 800.4 | 800.4 | 800.4 | 805.9 |
| 15° | 3470.1 | 2445.0 | 1058.0 | 827.8 | 794.9 | 773.0 | 767.5 | 762.0 | 762.0 | 762.0 | 762.0 |
| 17.5° | 3437.2 | 2209.3 | 921.0 | 783.9 | 756.5 | 734.6 | 729.1 | 723.6 | 723.6 | 729.1 | 729.1 |
| 20° | 3387.9 | 1984.5 | 827.8 | 740.1 | 718.1 | 696.2 | 690.7 | 685.3 | 690.7 | 690.7 | 690.7 |
| 22.5° | 3327.6 | 1798.1 | 773.0 | 707.2 | 679.8 | 657.8 | 657.8 | 657.8 | 657.8 | 657.8 | 663.3 |
| 25° | 3289.2 | 1666.5 | 734.6 | 668.8 | 641.4 | 625.0 | 619.5 | 619.5 | 630.4 | 630.4 | 635.9 |
| 27.5° | 3349.5 | 1633.6 | 740.1 | 657.8 | 608.5 | 592.1 | 586.6 | 586.6 | 597.5 | 603.0 | 608.5 |
| 30° | 3530.4 | 1694.0 | 805.9 | 690.7 | 586.6 | 559.2 | 553.7 | 553.7 | 570.1 | 575.6 | 581.1 |
| 32.5° | 3738.8 | 1820.0 | 904.5 | 734.6 | 570.1 | 526.3 | 515.3 | 515.3 | 531.8 | 537.2 | 542.7 |
| 35° | 4023.8 | 2017.4 | 1036.1 | 773.0 | 581.1 | 493.4 | 471.5 | 471.5 | 482.4 | 493.4 | 498.9 |
| 37.5° | 4391.1 | 2340.8 | 1189.6 | 800.4 | 581.1 | 455.0 | 427.6 | 422.1 | 433.1 | 433.1 | 438.6 |
| 40° | 4774.9 | 2762.9 | 1348.6 | 800.4 | 553.7 | 416.6 | 389.2 | 372.8 | 378.3 | 372.8 | 378.3 |
| 42.5° | 4988.7 | 3102.8 | 1485.6 | 751.0 | 520.8 | 378.3 | 350.9 | 328.9 | 323.4 | 312.5 | 318.0 |
| 45° | 5109.3 | 3256.3 | 1447.3 | 696.2 | 487.9 | 350.9 | 318.0 | 290.5 | 279.6 | 263.1 | 263.1 |
| 47.5° | 5109.3 | 3272.8 | 1238.9 | 652.4 | 455.0 | 328.9 | 285.1 | 257.7 | 241.2 | 224.8 | 230.2 |
| 50° | 5049.0 | 3124.8 | 981.3 | 608.5 | 416.6 | 307.0 | 257.7 | 235.7 | 213.8 | 202.8 | 202.8 |
| 52.5° | 4796.8 | 2642.3 | 751.0 | 553.7 | 372.8 | 279.6 | 230.2 | 208.3 | 186.4 | 180.9 | 180.9 |
| 55° | 4363.7 | 1940.6 | 608.5 | 498.9 | 334.4 | 257.7 | 208.3 | 191.9 | 169.9 | 159.0 | 159.0 |
| 57.5° | 3546.9 | 1326.7 | 504.3 | 449.5 | 296.0 | 230.2 | 186.4 | 169.9 | 142.5 | 131.6 | 131.6 |
| 60° | 2631.4 | 866.2 | 427.6 | 394.7 | 252.2 | 208.3 | 164.5 | 142.5 | 120.6 | 109.6 | 104.2 |
| 62.5° | 1776.2 | 586.6 | 356.3 | 312.5 | 213.8 | 180.9 | 142.5 | 120.6 | 93.2 | 71.3 | 71.3 |
| 65° | 1107.4 | 455.0 | 296.0 | 246.7 | 186.4 | 159.0 | 120.6 | 93.2 | 65.8 | 49.3 | 43.9 |
| 67.5° | 635.9 | 367.3 | 241.2 | 191.9 | 159.0 | 126.1 | 93.2 | 76.7 | 54.8 | 38.4 | 32.9 |
| 68° | *586.6* | *350.9* | *224.8* | *180.9* | *148.0* | *120.6* | *87.7* | *71.3* | *49.3* | *32.9* | *32.9* |
| 70° | 476.9 | 312.5 | 191.9 | 148.0 | 126.1 | 98.7 | 76.7 | 60.3 | 38.4 | 21.9 | 21.9 |
| 72.5° | 422.1 | 263.1 | 164.5 | 115.1 | 87.7 | 82.2 | 60.3 | 43.9 | 27.4 | 16.4 | 11.0 |
| 75° | 345.4 | 208.3 | 131.6 | 87.7 | 60.3 | 60.3 | 43.9 | 27.4 | 11.0 | 0.0 | 0.0 |
| 77.5° | 224.8 | 153.5 | 104.2 | 54.8 | 32.9 | 38.4 | 27.4 | 11.0 | 0.0 | 0.0 | 0.0 |
| 80° | 148.0 | 115.1 | 71.3 | 27.4 | 16.4 | 16.4 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 104.2 | 76.7 | 43.9 | 11.0 | 5.5 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 65.8 | 32.9 | 16.4 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 27.4 | 11.0 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-2

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-722-U-5WQ

Data in this report applies to families of products including GSS-SB1A-722-U-5WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

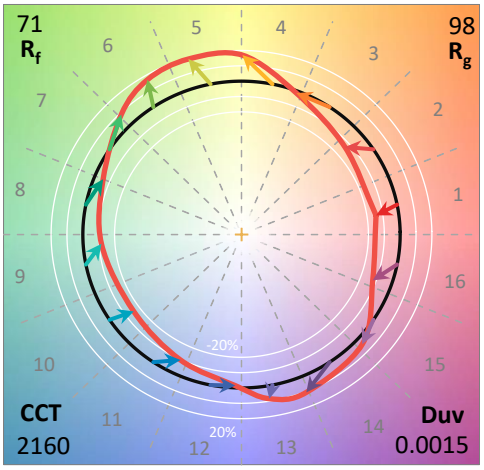
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-184-2 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 10/15/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGraw-Edison |
| Catalog Number: | **GSS-SB1A-722-U-5WQ** |
| Description: | GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI 2200K CCT 26 LEDS |

## Spectral Parameters

| | |
|---|---|
| CCT (K): | 2160 |
| CIE u': | 0.2927 |
| CIE v': | 0.5388 |
| Duv: | 0.0015 |
| CIE x: | 0.5130 |
| CIE y: | 0.4197 |
| CIE z: | 0.0674 |
| Peak Wavelength (nm): | 609 |
| Dominant Wavelength (nm): | 587 |
| Purity: | 79.96089 |
| Rf: | 70.6 |
| Rg: | 97.6 |

| | |
|---|---|
| CRI (Ra): | 71.9 |
| R1: | 68.7 |
| R2: | 82.6 |
| R3: | 95.5 |
| R4: | 66.4 |
| R5: | 65.4 |
| R6: | 75.9 |
| R7: | 77.2 |
| R8: | 43.5 |
| R9: | -17.8 |
| R10: | 60.5 |
| R11: | 60.2 |
| R12: | 48.2 |
| R13: | 70.7 |
| R14: | 96.8 |
| R15: | 61.8 |




## Test Conditions

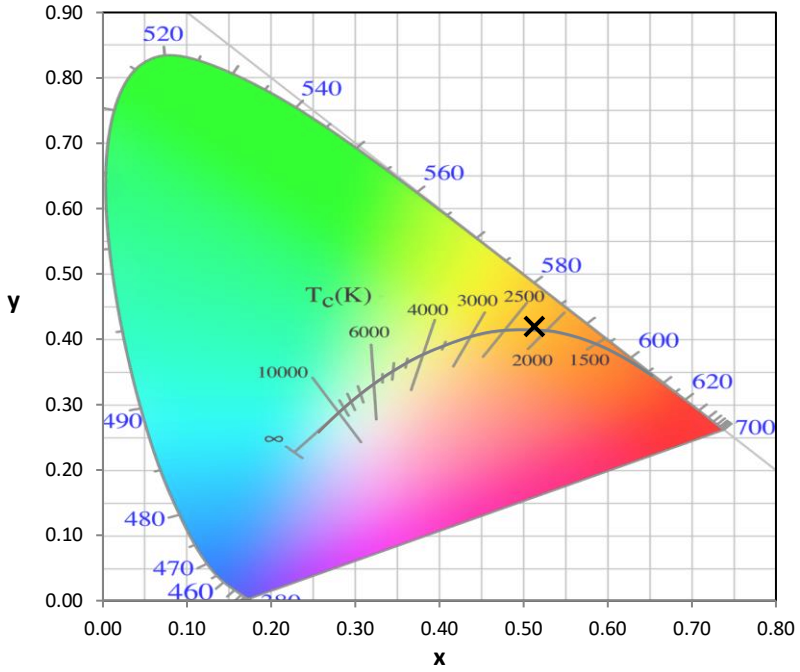
| | |
|---|---|
| Stabilization Time: | 21M |
| Operation Time: | 1H 21M |
| Sphere Temperature (°C): | 25.2 |

REPORT NUMBER: SP1-2407-184-2

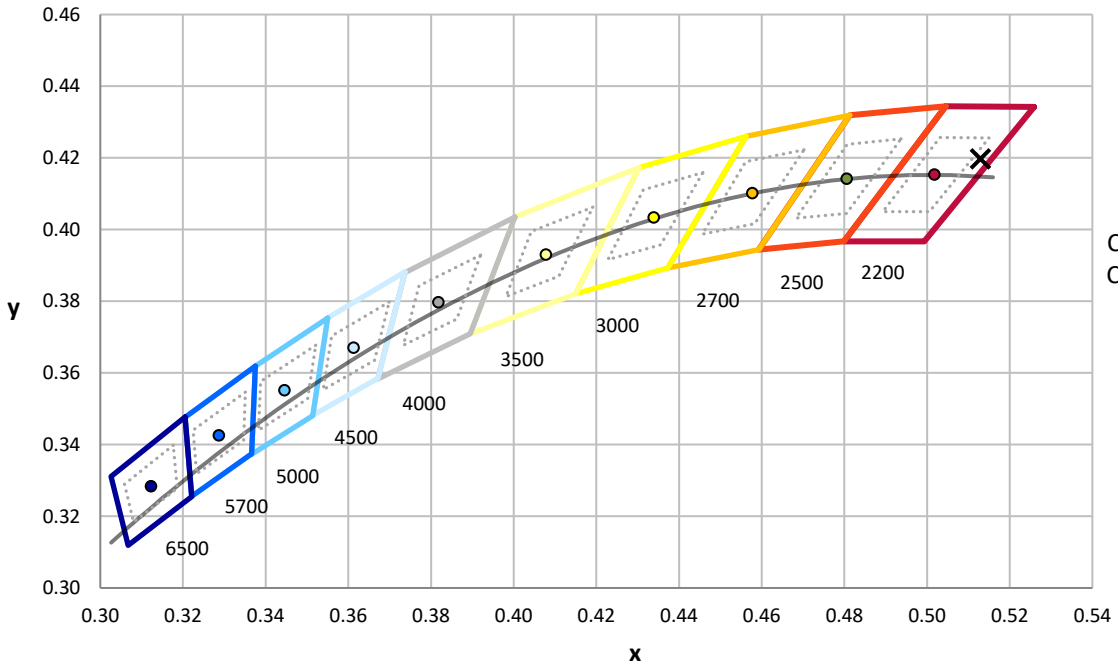
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC 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: SP1-2407-184-2

## CIE 1931 Chromaticity Diagram




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

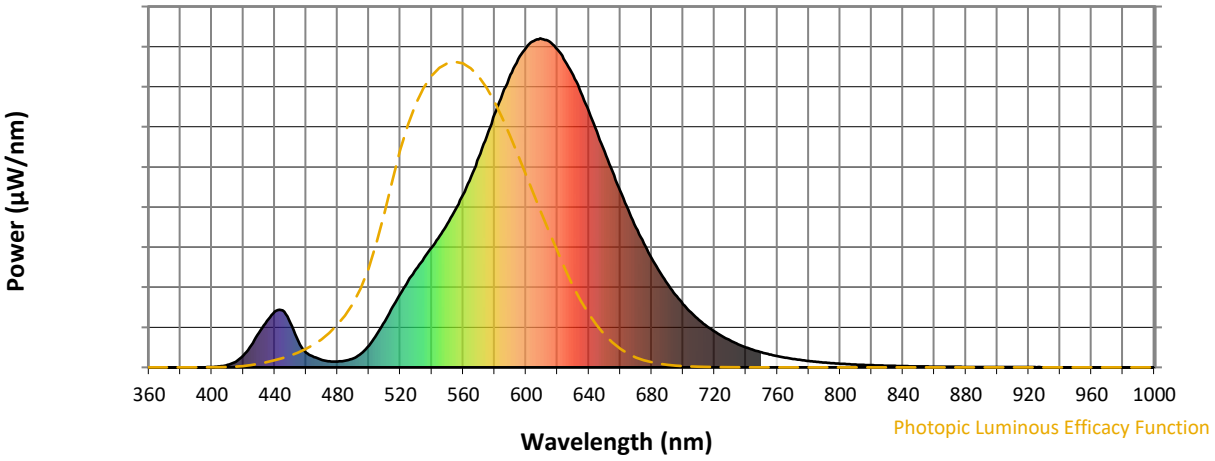



CCT = 2160K
CIE x = 0.5130
CIE y = 0.4197
Duv = 0.0015

Point lies inside the ANSI 2200K 7-step quadrangle

REPORT NUMBER: SP1-2407-184-2

## Photopic Flux vs. Wavelength

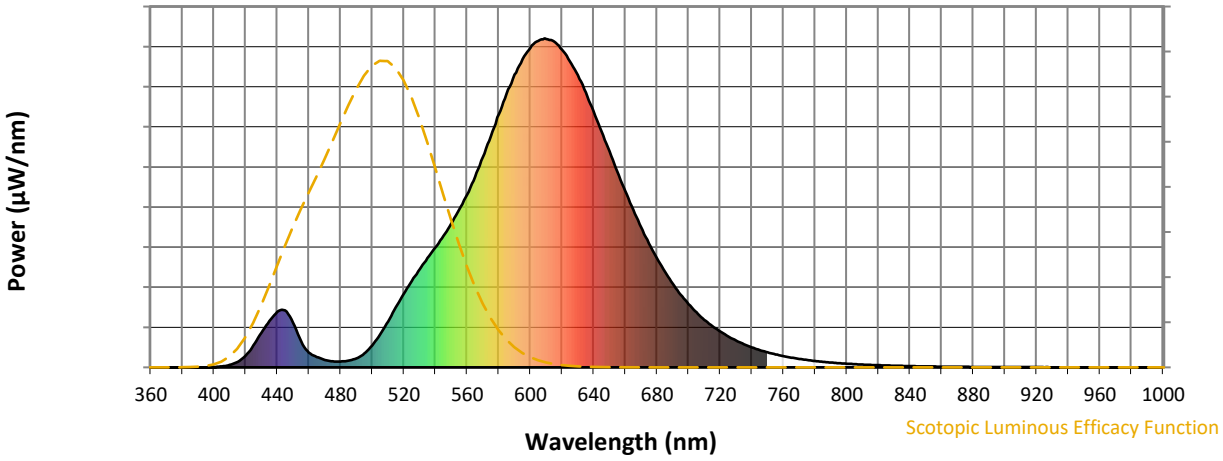



## Photopic Lumens: NR

| 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 | 27 | NR | 620 | 966 | NR | 750 | 46 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 42 | NR | 625 | 930 | NR | 755 | 39 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 67 | NR | 630 | 888 | NR | 760 | 34 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 101 | NR | 635 | 835 | NR | 765 | 30 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 139 | NR | 640 | 778 | NR | 770 | 26 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 183 | NR | 645 | 717 | NR | 775 | 22 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 224 | NR | 650 | 656 | NR | 780 | 19 | NR | 910 | 1 | NR |
| 395 | 0 | NR | 525 | 262 | NR | 655 | 595 | NR | 785 | 17 | NR | 915 | 1 | NR |
| 400 | 1 | NR | 530 | 299 | NR | 660 | 536 | NR | 790 | 15 | NR | 920 | 1 | NR |
| 405 | 3 | NR | 535 | 332 | NR | 665 | 480 | NR | 795 | 13 | NR | 925 | 1 | NR |
| 410 | 7 | NR | 540 | 365 | NR | 670 | 425 | NR | 800 | 11 | NR | 930 | 1 | NR |
| 415 | 17 | NR | 545 | 400 | NR | 675 | 376 | NR | 805 | 10 | NR | 935 | 0 | NR |
| 420 | 36 | NR | 550 | 437 | NR | 680 | 332 | NR | 810 | 8 | NR | 940 | 0 | NR |
| 425 | 67 | NR | 555 | 479 | NR | 685 | 291 | NR | 815 | 8 | NR | 945 | 0 | NR |
| 430 | 105 | NR | 560 | 525 | NR | 690 | 255 | NR | 820 | 7 | NR | 950 | 0 | NR |
| 435 | 141 | NR | 565 | 579 | NR | 695 | 221 | NR | 825 | 6 | NR | 955 | 0 | NR |
| 440 | 169 | NR | 570 | 639 | NR | 700 | 192 | NR | 830 | 5 | NR | 960 | 0 | NR |
| 445 | 173 | NR | 575 | 703 | NR | 705 | 167 | NR | 835 | 4 | NR | 965 | 0 | NR |
| 450 | 136 | NR | 580 | 769 | NR | 710 | 144 | NR | 840 | 4 | NR | 970 | 0 | NR |
| 455 | 80 | NR | 585 | 832 | NR | 715 | 125 | NR | 845 | 3 | NR | 975 | 0 | NR |
| 460 | 45 | NR | 590 | 890 | NR | 720 | 109 | NR | 850 | 3 | NR | 980 | 0 | NR |
| 465 | 32 | NR | 595 | 937 | NR | 725 | 94 | NR | 855 | 3 | NR | 985 | 0 | NR |
| 470 | 23 | NR | 600 | 972 | NR | 730 | 81 | NR | 860 | 2 | NR | 990 | 0 | NR |
| 475 | 18 | NR | 605 | 992 | NR | 735 | 70 | NR | 865 | 2 | NR | 995 | 0 | NR |
| 480 | 18 | NR | 610 | 998 | NR | 740 | 61 | NR | 870 | 2 | NR | 1000 | 0 | NR |
| 485 | 20 | NR | 615 | 990 | NR | 745 | 53 | NR | 875 | 2 | NR | | | |

REPORT NUMBER: SP1-2407-184-2

## Scotopic Flux vs. Wavelength

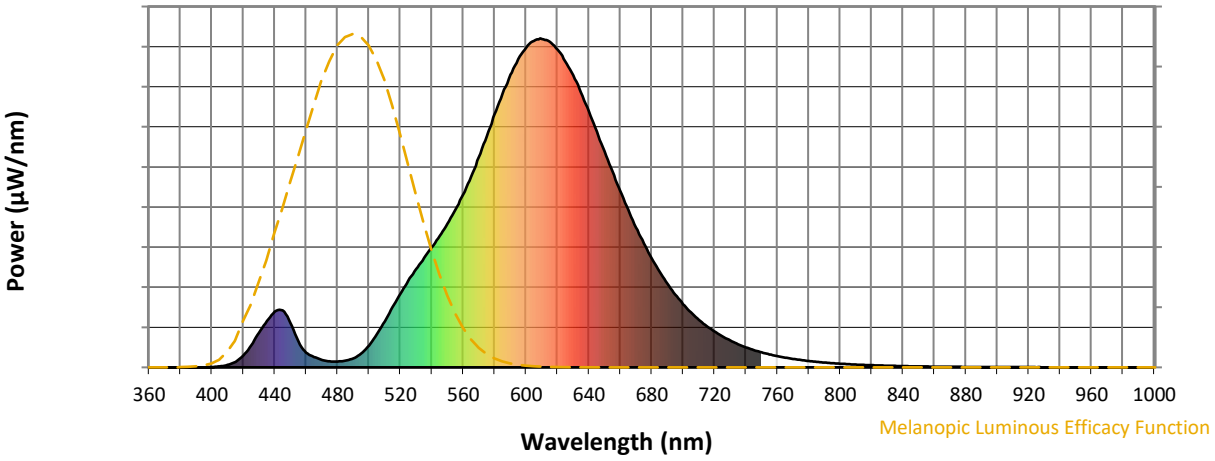



**Scotopic Lumens: NR** **S/P: 0.8**

| 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 | 27 | NR | 620 | 966 | NR | 750 | 46 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 42 | NR | 625 | 930 | NR | 755 | 39 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 67 | NR | 630 | 888 | NR | 760 | 34 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 101 | NR | 635 | 835 | NR | 765 | 30 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 139 | NR | 640 | 778 | NR | 770 | 26 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 183 | NR | 645 | 717 | NR | 775 | 22 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 224 | NR | 650 | 656 | NR | 780 | 19 | NR | 910 | 1 | NR |
| 395 | 0 | NR | 525 | 262 | NR | 655 | 595 | NR | 785 | 17 | NR | 915 | 1 | NR |
| 400 | 1 | NR | 530 | 299 | NR | 660 | 536 | NR | 790 | 15 | NR | 920 | 1 | NR |
| 405 | 3 | NR | 535 | 332 | NR | 665 | 480 | NR | 795 | 13 | NR | 925 | 1 | NR |
| 410 | 7 | NR | 540 | 365 | NR | 670 | 425 | NR | 800 | 11 | NR | 930 | 1 | NR |
| 415 | 17 | NR | 545 | 400 | NR | 675 | 376 | NR | 805 | 10 | NR | 935 | 0 | NR |
| 420 | 36 | NR | 550 | 437 | NR | 680 | 332 | NR | 810 | 8 | NR | 940 | 0 | NR |
| 425 | 67 | NR | 555 | 479 | NR | 685 | 291 | NR | 815 | 8 | NR | 945 | 0 | NR |
| 430 | 105 | NR | 560 | 525 | NR | 690 | 255 | NR | 820 | 7 | NR | 950 | 0 | NR |
| 435 | 141 | NR | 565 | 579 | NR | 695 | 221 | NR | 825 | 6 | NR | 955 | 0 | NR |
| 440 | 169 | NR | 570 | 639 | NR | 700 | 192 | NR | 830 | 5 | NR | 960 | 0 | NR |
| 445 | 173 | NR | 575 | 703 | NR | 705 | 167 | NR | 835 | 4 | NR | 965 | 0 | NR |
| 450 | 136 | NR | 580 | 769 | NR | 710 | 144 | NR | 840 | 4 | NR | 970 | 0 | NR |
| 455 | 80 | NR | 585 | 832 | NR | 715 | 125 | NR | 845 | 3 | NR | 975 | 0 | NR |
| 460 | 45 | NR | 590 | 890 | NR | 720 | 109 | NR | 850 | 3 | NR | 980 | 0 | NR |
| 465 | 32 | NR | 595 | 937 | NR | 725 | 94 | NR | 855 | 3 | NR | 985 | 0 | NR |
| 470 | 23 | NR | 600 | 972 | NR | 730 | 81 | NR | 860 | 2 | NR | 990 | 0 | NR |
| 475 | 18 | NR | 605 | 992 | NR | 735 | 70 | NR | 865 | 2 | NR | 995 | 0 | NR |
| 480 | 18 | NR | 610 | 998 | NR | 740 | 61 | NR | 870 | 2 | NR | 1000 | 0 | NR |
| 485 | 20 | NR | 615 | 990 | NR | 745 | 53 | NR | 875 | 2 | NR | | | |

REPORT NUMBER: SP1-2407-184-2

## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 1.21**

| 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 | 27 | NR | 620 | 966 | NR | 750 | 46 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 42 | NR | 625 | 930 | NR | 755 | 39 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 67 | NR | 630 | 888 | NR | 760 | 34 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 101 | NR | 635 | 835 | NR | 765 | 30 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 139 | NR | 640 | 778 | NR | 770 | 26 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 183 | NR | 645 | 717 | NR | 775 | 22 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 224 | NR | 650 | 656 | NR | 780 | 19 | NR | 910 | 1 | NR |
| 395 | 0 | NR | 525 | 262 | NR | 655 | 595 | NR | 785 | 17 | NR | 915 | 1 | NR |
| 400 | 1 | NR | 530 | 299 | NR | 660 | 536 | NR | 790 | 15 | NR | 920 | 1 | NR |
| 405 | 3 | NR | 535 | 332 | NR | 665 | 480 | NR | 795 | 13 | NR | 925 | 1 | NR |
| 410 | 7 | NR | 540 | 365 | NR | 670 | 425 | NR | 800 | 11 | NR | 930 | 1 | NR |
| 415 | 17 | NR | 545 | 400 | NR | 675 | 376 | NR | 805 | 10 | NR | 935 | 0 | NR |
| 420 | 36 | NR | 550 | 437 | NR | 680 | 332 | NR | 810 | 8 | NR | 940 | 0 | NR |
| 425 | 67 | NR | 555 | 479 | NR | 685 | 291 | NR | 815 | 8 | NR | 945 | 0 | NR |
| 430 | 105 | NR | 560 | 525 | NR | 690 | 255 | NR | 820 | 7 | NR | 950 | 0 | NR |
| 435 | 141 | NR | 565 | 579 | NR | 695 | 221 | NR | 825 | 6 | NR | 955 | 0 | NR |
| 440 | 169 | NR | 570 | 639 | NR | 700 | 192 | NR | 830 | 5 | NR | 960 | 0 | NR |
| 445 | 173 | NR | 575 | 703 | NR | 705 | 167 | NR | 835 | 4 | NR | 965 | 0 | NR |
| 450 | 136 | NR | 580 | 769 | NR | 710 | 144 | NR | 840 | 4 | NR | 970 | 0 | NR |
| 455 | 80 | NR | 585 | 832 | NR | 715 | 125 | NR | 845 | 3 | NR | 975 | 0 | NR |
| 460 | 45 | NR | 590 | 890 | NR | 720 | 109 | NR | 850 | 3 | NR | 980 | 0 | NR |
| 465 | 32 | NR | 595 | 937 | NR | 725 | 94 | NR | 855 | 3 | NR | 985 | 0 | NR |
| 470 | 23 | NR | 600 | 972 | NR | 730 | 81 | NR | 860 | 2 | NR | 990 | 0 | NR |
| 475 | 18 | NR | 605 | 992 | NR | 735 | 70 | NR | 865 | 2 | NR | 995 | 0 | NR |
| 480 | 18 | NR | 610 | 998 | NR | 740 | 61 | NR | 870 | 2 | NR | 1000 | 0 | NR |
| 485 | 20 | NR | 615 | 990 | NR | 745 | 53 | NR | 875 | 2 | NR | | | |

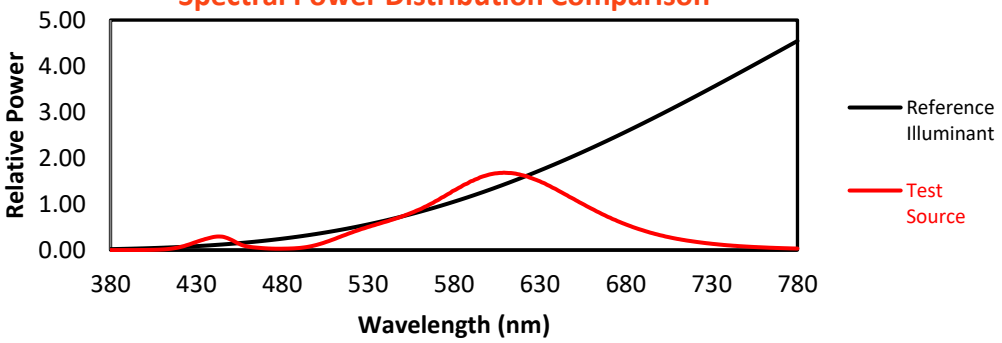
REPORT NUMBER: SP1-2407-184-2

# TM-30-18

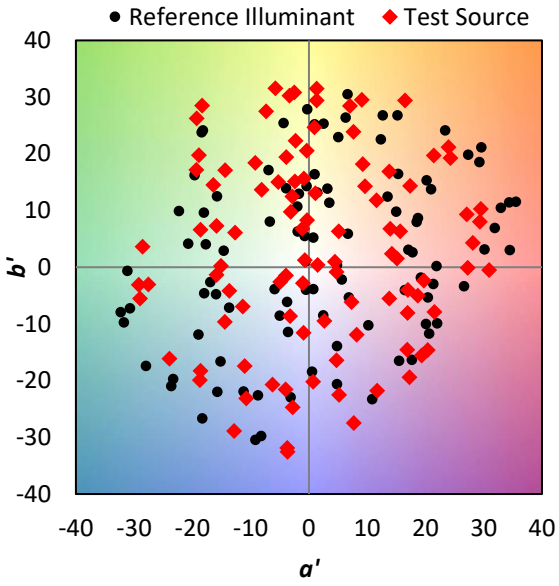
## Summary

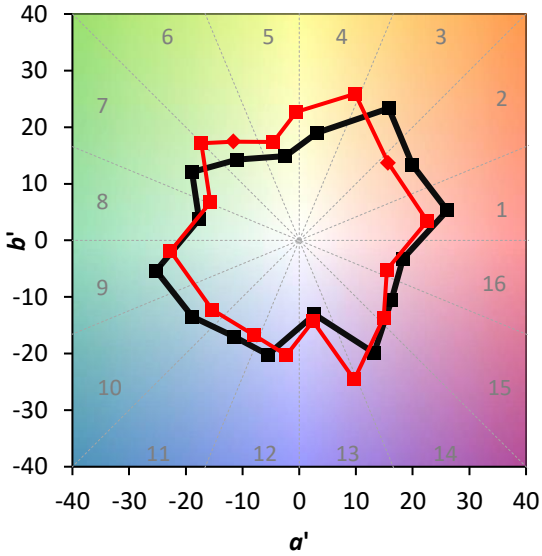
$R_f$ = 70.6
$R_g$ = 97.6
CIE $R_a$ = 71.9
$R_9$ = -17.8

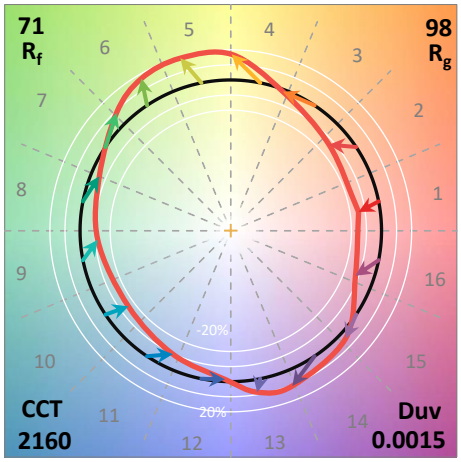
## Spectral Power Distribution Comparison

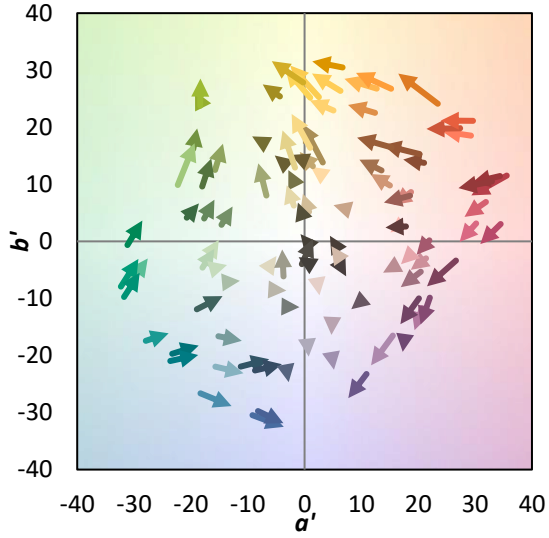



## Color Vector Graphics



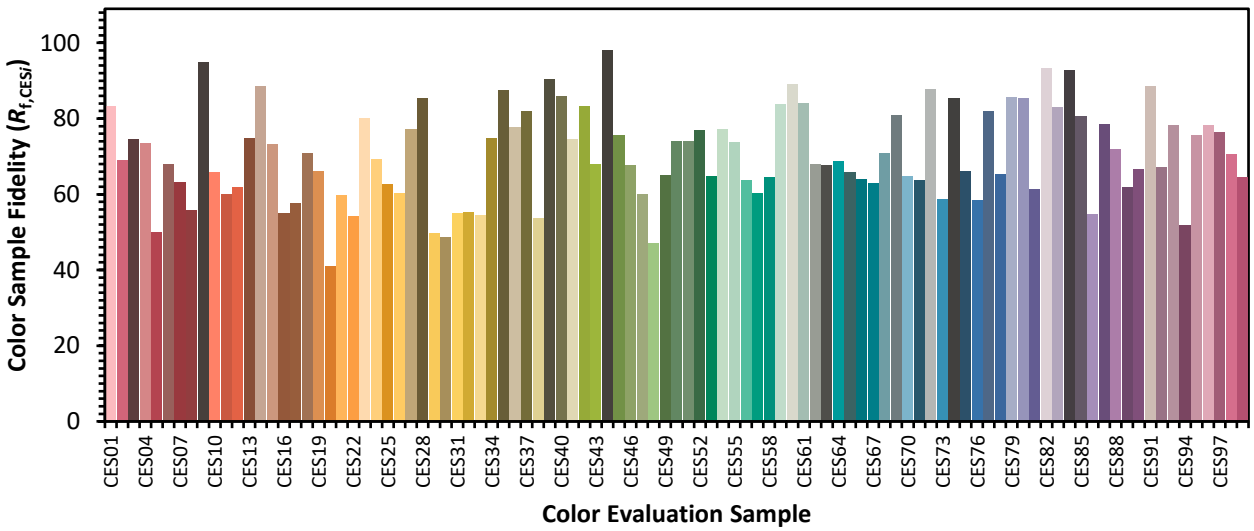



REPORT NUMBER: SP1-2407-184-2

# TM-30-18

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

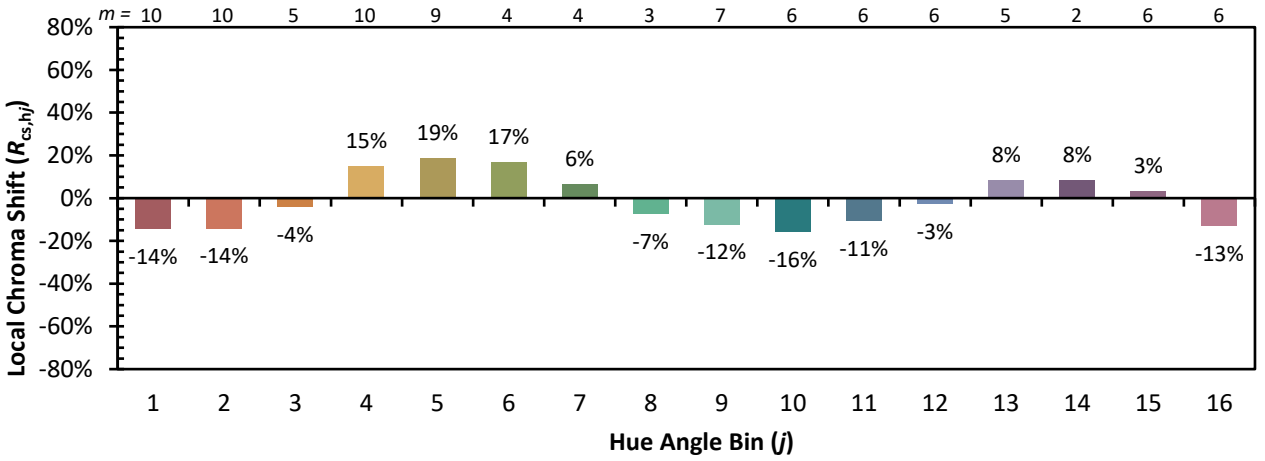
| | | | |
|---|---|---|---|
| CES01 = 87 | CES26 = 60 | CES51 = 74 | CES76 = 58 |
| CES02 = 65 | CES27 = 77 | CES52 = 77 | CES77 = 82 |
| CES03 = 32 | CES28 = 85 | CES53 = 65 | CES78 = 65 |
| CES04 = 72 | CES29 = 50 | CES54 = 77 | CES79 = 86 |
| CES05 = 52 | CES30 = 49 | CES55 = 74 | CES80 = 85 |
| CES06 = 53 | CES31 = 55 | CES56 = 64 | CES81 = 61 |
| CES07 = 44 | CES32 = 55 | CES57 = 60 | CES82 = 93 |
| CES08 = 43 | CES33 = 55 | CES58 = 64 | CES83 = 83 |
| CES09 = 29 | CES34 = 75 | CES59 = 84 | CES84 = 93 |
| CES10 = 79 | CES35 = 88 | CES60 = 89 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 55 |
| CES12 = 68 | CES37 = 82 | CES62 = 68 | CES87 = 79 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 86 | CES65 = 66 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 89 |
| CES17 = 51 | CES42 = 83 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 68 | CES68 = 71 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 81 | CES94 = 52 |
| CES20 = 68 | CES45 = 76 | CES70 = 65 | CES95 = 76 |
| CES21 = 89 | CES46 = 68 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 60 | CES72 = 88 | CES97 = 76 |
| CES23 = 92 | CES48 = 47 | CES73 = 59 | CES98 = 71 |
| CES24 = 92 | CES49 = 65 | CES74 = 85 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 | |

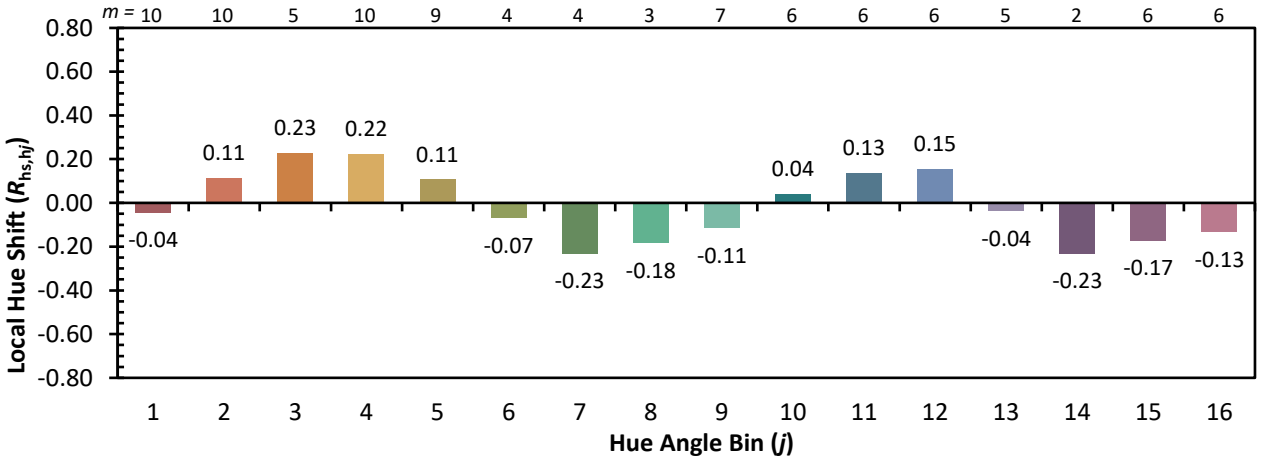


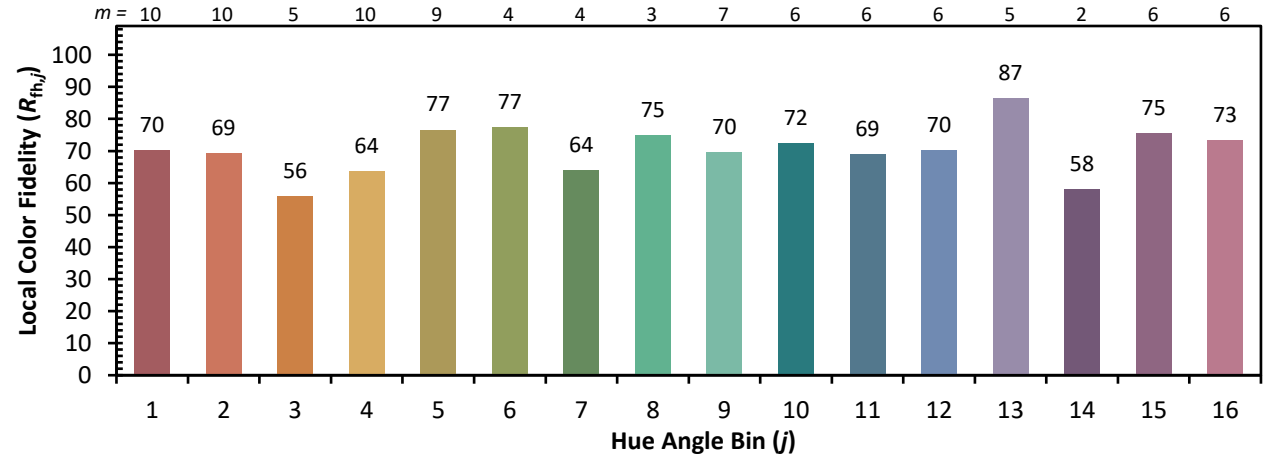
REPORT NUMBER: SP1-2407-184-2

# TM-30-18

## Color Rendition by Hue-Angle Bin



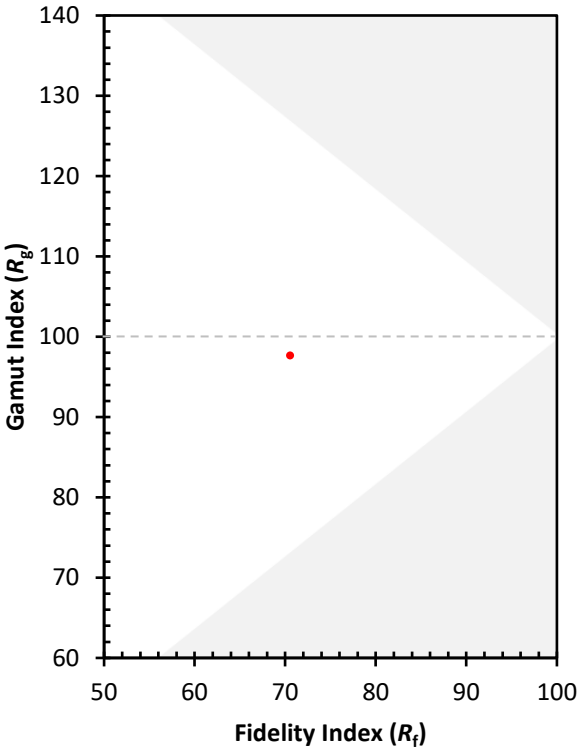



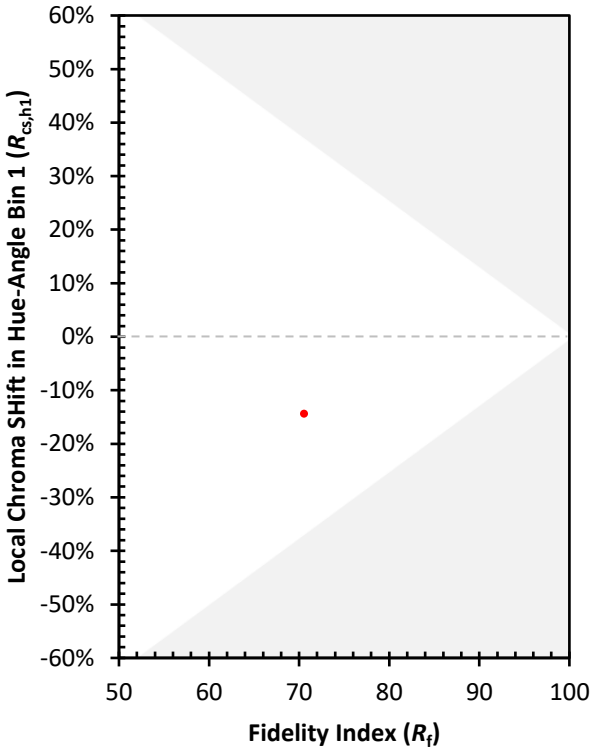



REPORT NUMBER: SP1-2407-184-2

# TM-30-18

## Measure Comparisons




(END OF REPORT)