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: P318551

Luminaire Tested: **GLEON-SA7A-830-U-T3**

Issue Date: 3/3/2020

Report Generated By E0585644

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: | P318551 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-14) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA7A-830-U-T3 |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (7) 80 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 26199 lumens |
| Efficiency: | N/A |
| Efficacy: | 115.9 lumens/watt |
| Luminous Opening: | Rectangular (W 2' x L: 1' x H: 0') |
| IES Classification: | Type III - Short |
| BUG Rating: | B3 - U0 - G4 |

| | |
|---|---|
| Input Watts (W): | 226 |
| 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: | 24 FT |

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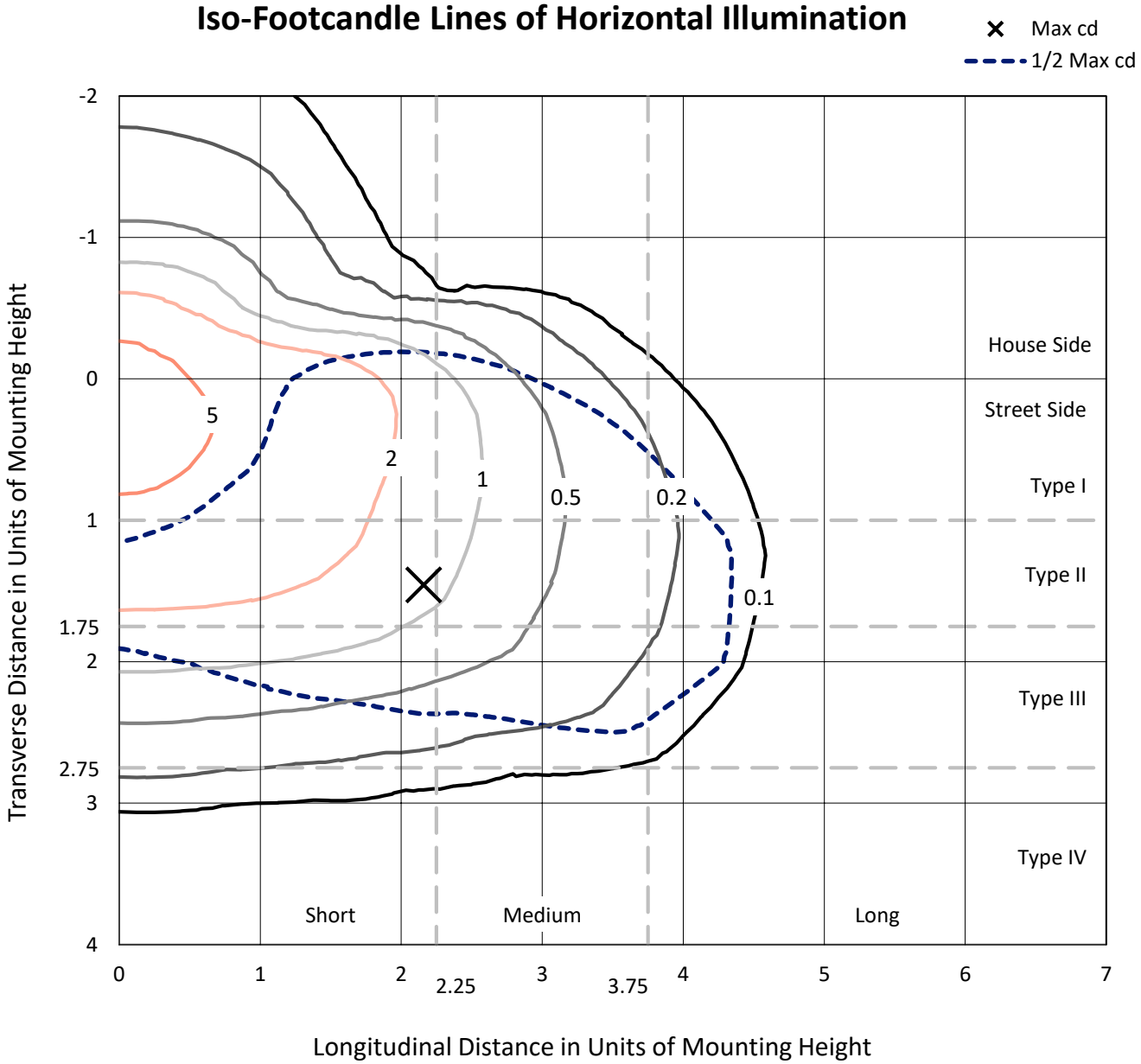
Scaled Data Report

REPORT NUMBER: P318551
CATALOG NUMBER: GLEON-SA7A-830-U-T3

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 6 fc
Type III - Short - N/A

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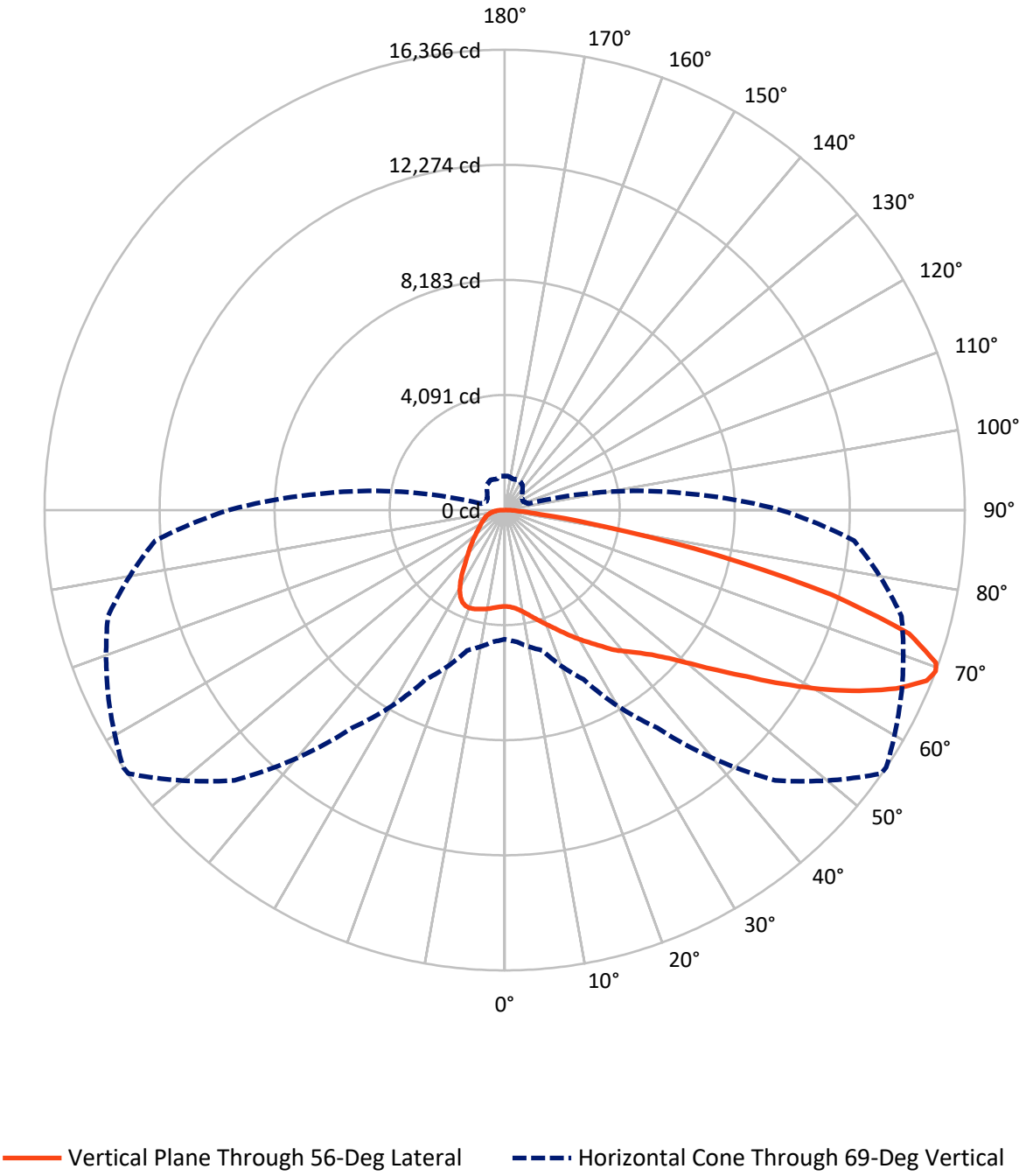
## Luminous Intensity Polar Plot



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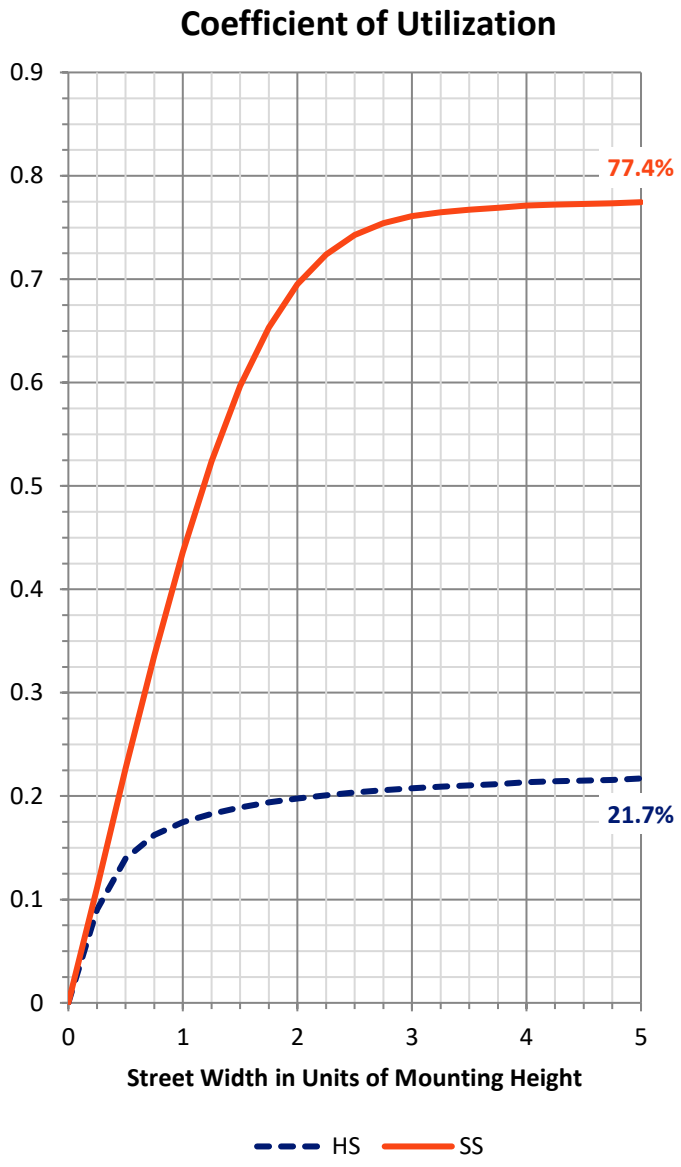
CATALOG NUMBER: GLEON-SA7A-830-U-T3

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 5834.5 | 0.0 | 5834.5 |
| | % Fixture | 22.3 | 0.0 | 22.3 |
| **Street Side** | Lumens | 20364.5 | 0.0 | 20364.5 |
| | % Fixture | 77.7 | 0.0 | 77.7 |
| **Total** | Lumens | 26199.0 | 0.0 | 26199.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 336.4 | 1.3 |
| 10°-20° | 1081.7 | 4.1 |
| 20°-30° | 1888.3 | 7.2 |
| 30°-40° | 2712.5 | 10.4 |
| 40°-50° | 3753.9 | 14.3 |
| 50°-60° | 5500.0 | 21.0 |
| 60°-70° | 6705.5 | 25.6 |
| 70°-80° | 3707.2 | 14.2 |
| 80°-90° | 513.5 | 2.0 |
| 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° | 26199.0 | 100.0 |
| 0°-180° | 26199.0 | 100.0 |



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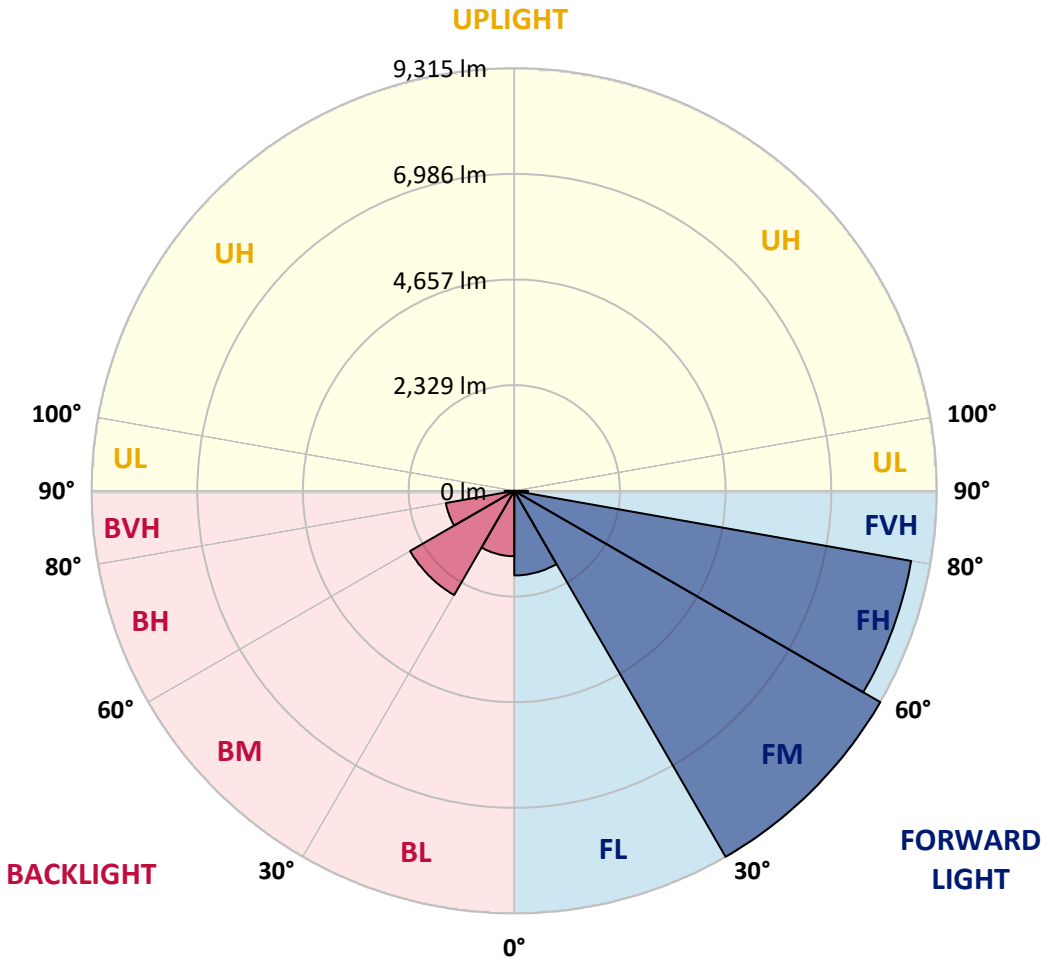
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1864.6 | 7.1 | | | |
| FM | (30°-60°) | 9314.7 | 35.6 | | | |
| FH | (60°-80°) | 8882.8 | 33.9 | | | G4/12000 |
| FVH | (80°-90°) | 302.4 | 1.2 | | | G3/500 |
| BL | (0°-30°) | 1441.8 | 5.5 | B3/2500 | | |
| BM | (30°-60°) | 2651.6 | 10.1 | B3/5000 | | |
| BH | (60°-80°) | 1530.0 | 5.8 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 211.0 | 0.8 | | | G2/225 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B3-U0-G4**
Type III Short



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Scaled Data Report

REPORT NUMBER: P318551
CATALOG NUMBER: GLEON-SA7A-830-U-T3

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 56° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3425.1 | 3425.1 | 3425.1 | 3425.1 | 3425.1 | 3425.1 | 3425.1 | *3425.1* | 3425.1 | 3425.1 | 3425.1 |
| 2.5° | 3446.8 | 3450.4 | 3447.7 | 3454.9 | 3446.8 | 3452.2 | 3447.7 | *3447.7* | 3445.0 | 3436.9 | 3427.8 |
| 5° | 3500.9 | 3508.2 | 3503.6 | 3510.9 | 3500.9 | 3502.7 | 3494.6 | *3494.6* | 3486.5 | 3469.3 | 3451.3 |
| 7.5° | 3585.8 | 3593.9 | 3590.3 | 3597.5 | 3584.0 | 3584.0 | 3573.1 | *3572.2* | 3556.0 | 3528.0 | 3507.3 |
| 10° | 3686.9 | 3697.7 | 3694.1 | 3704.9 | 3694.1 | 3697.7 | 3686.9 | *3686.9* | 3665.2 | 3625.5 | 3599.3 |
| 12.5° | 3834.0 | 3847.5 | 3837.6 | 3836.7 | 3832.2 | 3839.4 | 3830.4 | *3828.6* | 3808.7 | 3754.6 | 3718.4 |
| 15° | 4030.7 | 4045.2 | 4024.4 | 4022.6 | 3997.3 | 3994.6 | 3994.6 | *3991.9* | 3979.3 | 3914.3 | 3854.7 |
| 17.5° | 4257.3 | 4261.8 | 4243.7 | 4214.8 | 4182.4 | 4161.6 | 4158.9 | *4166.1* | 4166.1 | 4090.3 | 3995.5 |
| 20° | 4479.3 | 4487.4 | 4473.0 | 4440.5 | 4399.0 | 4368.3 | 4346.6 | *4361.1* | 4360.2 | 4269.9 | 4135.4 |
| 22.5° | 4721.2 | 4740.1 | 4718.5 | 4676.9 | 4628.2 | 4593.9 | 4556.0 | *4568.6* | 4569.5 | 4458.5 | 4272.6 |
| 25° | 5034.3 | 5017.2 | 5003.7 | 4945.0 | 4875.5 | 4840.3 | 4805.1 | *4817.7* | 4814.1 | 4661.6 | 4414.3 |
| 27.5° | 5311.4 | 5315.0 | 5297.0 | 5234.7 | 5154.4 | 5076.8 | 5075.0 | *5083.1* | 5069.5 | 4872.8 | 4547.9 |
| 30° | 5633.6 | 5635.4 | 5610.2 | 5554.2 | 5466.7 | 5366.5 | 5343.0 | *5356.6* | 5327.7 | 5073.2 | 4688.7 |
| 32.5° | 5954.0 | 5963.1 | 5935.1 | 5867.4 | 5797.0 | 5675.1 | 5628.2 | *5637.2* | 5565.0 | 5278.0 | 4834.0 |
| 35° | 6234.7 | 6247.4 | 6238.3 | 6193.2 | 6116.5 | 6011.8 | 5955.8 | *5950.4* | 5861.1 | 5528.9 | 5026.2 |
| 37.5° | 6520.8 | 6532.6 | 6522.6 | 6484.7 | 6454.0 | 6343.0 | 6313.2 | *6313.2* | 6158.0 | 5785.3 | 5270.8 |
| 40° | 6815.1 | 6833.1 | 6821.4 | 6769.0 | 6742.8 | 6692.3 | 6621.0 | *6603.9* | 6436.0 | 6093.0 | 5669.7 |
| 42.5° | 7088.5 | 7112.0 | 7158.9 | 7128.2 | 7075.0 | 7082.2 | 6938.7 | *6929.7* | 6806.9 | 6547.9 | 6170.6 |
| 45° | 7476.6 | 7510.9 | 7590.3 | 7566.9 | 7556.0 | 7516.3 | 7345.7 | *7337.6* | 7290.7 | 7159.8 | 6792.5 |
| 47.5° | 7899.9 | 7946.8 | 8090.3 | 8094.8 | 8211.3 | 8136.4 | 7904.4 | *7876.4* | 7887.3 | 7892.7 | 7551.5 |
| 50° | 8289.8 | 8341.2 | 8576.8 | 8687.8 | 8962.2 | 8978.4 | 8607.5 | *8582.2* | 8624.6 | 8749.2 | 8436.0 |
| 52.5° | 8601.2 | 8666.2 | 8960.4 | 9303.3 | 9773.6 | 9907.1 | 9473.0 | *9454.1* | 9485.7 | 9700.5 | 9436.0 |
| 55° | 8829.5 | 8899.9 | 9220.3 | 9844.9 | 10595.8 | 10831.3 | 10469.4 | *10451.4* | 10471.2 | 10744.7 | 10523.6 |
| 57.5° | 8882.8 | 8899.9 | 9364.7 | 10209.5 | 11289.8 | 11855.7 | 11688.7 | *11652.6* | 11555.2 | 11793.4 | 11723.9 |
| 60° | 8632.8 | 8701.4 | 9245.6 | 10337.6 | 11826.8 | 12865.7 | 12963.1 | *12918.0* | 12644.5 | 12839.5 | 12783.5 |
| 62.5° | 8125.5 | 8248.3 | 8800.6 | 10142.7 | 12037.1 | 13690.6 | 14213.1 | *14159.0* | 13687.9 | 13814.2 | 13545.3 |
| 65° | 7297.0 | 7349.4 | 7929.7 | 9470.3 | 11770.0 | 14218.6 | 15327.8 | *15300.7* | 14707.7 | 14510.1 | 13686.1 |
| 67.5° | 5815.0 | 5913.4 | 6406.2 | 8065.1 | 10677.0 | 14156.3 | 16189.7 | *16187.0* | 15373.8 | 14768.2 | 13187.0 |
| 69° | *4593.9* | *4695.9* | *5165.2* | *6643.6* | *9447.7* | *13586.8* | *16334.1* | *16365.7* | *15561.5* | *14611.2* | *12474.0* |
| 70° | 3662.5 | 3780.7 | 4102.9 | 5595.7 | 8356.6 | 12835.9 | 16214.1 | *16270.9* | 15525.4 | 14352.1 | 11816.0 |
| 72.5° | 1558.7 | 1654.3 | 1883.6 | 2884.5 | 5093.0 | 9584.9 | 14825.1 | *15039.9* | 14688.8 | 13135.5 | 9765.4 |
| 75° | 680.5 | 710.3 | 814.1 | 1176.0 | 2260.9 | 5216.7 | 11613.8 | *12011.0* | 12559.7 | 11103.0 | 7274.4 |
| 77.5° | 498.2 | 510.8 | 567.7 | 690.4 | 1014.5 | 1970.2 | 7468.5 | *7699.5* | 9057.9 | 8079.5 | 4462.1 |
| 80° | 385.4 | 394.4 | 438.6 | 507.2 | 662.5 | 796.9 | 3406.2 | *3604.7* | 5093.0 | 4149.9 | 1858.3 |
| 82.5° | 306.9 | 313.2 | 343.9 | 373.6 | 457.6 | 482.9 | 1130.9 | *1254.5* | 1880.0 | 1146.2 | 491.9 |
| 85° | 285.2 | 292.4 | 303.3 | 272.6 | 293.3 | 283.4 | 489.2 | *511.7* | 567.7 | 450.4 | 205.8 |
| 87.5° | 129.1 | 152.5 | 300.5 | 212.1 | 156.1 | 124.5 | 200.4 | *209.4* | 235.6 | 236.5 | 91.2 |
| 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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Scaled Data Report

REPORT NUMBER: P318551
CATALOG NUMBER: GLEON-SA7A-830-U-T3

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3425.1 | 3425.1 | 3425.1 | 3425.1 | 3425.1 | 3425.1 | 3425.1 | 3425.1 | 3425.1 | 3425.1 | 3425.1 |
| 2.5° | 3433.2 | 3430.5 | 3435.1 | 3424.2 | 3437.8 | 3436.9 | 3432.3 | 3434.2 | 3443.2 | 3442.3 | 3443.2 |
| 5° | 3454.0 | 3452.2 | 3457.6 | 3449.5 | 3465.7 | 3471.2 | 3472.1 | 3480.2 | 3490.1 | 3492.8 | 3492.8 |
| 7.5° | 3506.4 | 3506.4 | 3509.1 | 3498.2 | 3509.1 | 3508.2 | 3503.6 | 3511.8 | 3521.7 | 3522.6 | 3521.7 |
| 10° | 3596.6 | 3597.5 | 3593.0 | 3565.0 | 3556.0 | 3531.6 | 3509.1 | 3510.0 | 3522.6 | 3532.5 | 3535.2 |
| 12.5° | 3710.3 | 3706.7 | 3686.9 | 3635.4 | 3597.5 | 3547.9 | 3524.4 | 3523.5 | 3536.1 | 3544.3 | 3547.0 |
| 15° | 3840.3 | 3830.4 | 3778.9 | 3695.0 | 3628.2 | 3579.5 | 3541.6 | 3532.5 | 3525.3 | 3516.3 | 3517.2 |
| 17.5° | 3963.0 | 3940.5 | 3854.7 | 3738.3 | 3667.9 | 3602.9 | 3529.8 | 3471.2 | 3430.5 | 3407.1 | 3399.9 |
| 20° | 4087.6 | 4043.4 | 3919.7 | 3778.9 | 3689.6 | 3571.3 | 3430.5 | 3311.4 | 3237.4 | 3203.1 | 3196.8 |
| 22.5° | 4201.3 | 4130.0 | 3980.2 | 3821.3 | 3672.4 | 3464.8 | 3243.7 | 3070.4 | 2967.5 | 2921.5 | 2925.1 |
| 25° | 4312.3 | 4213.0 | 4043.4 | 3851.1 | 3585.8 | 3277.1 | 2983.8 | 2770.8 | 2651.7 | 2600.2 | 2598.4 |
| 27.5° | 4409.8 | 4297.0 | 4112.0 | 3826.8 | 3424.2 | 3010.0 | 2676.0 | 2468.4 | 2369.2 | 2324.9 | 2317.7 |
| 30° | 4521.7 | 4402.6 | 4203.1 | 3733.8 | 3187.8 | 2701.3 | 2375.5 | 2229.3 | 2158.9 | 2114.6 | 2106.5 |
| 32.5° | 4658.0 | 4546.1 | 4278.0 | 3565.0 | 2885.4 | 2379.1 | 2140.8 | 2038.8 | 1974.7 | 1925.1 | 1916.1 |
| 35° | 4856.5 | 4735.6 | 4297.0 | 3323.1 | 2553.3 | 2124.6 | 1968.4 | 1863.7 | 1777.1 | 1713.0 | 1706.7 |
| 37.5° | 5105.6 | 4973.0 | 4253.7 | 3010.0 | 2231.1 | 1959.4 | 1824.9 | 1695.9 | 1583.0 | 1492.8 | 1478.4 |
| 40° | 5464.9 | 5264.5 | 4133.6 | 2648.9 | 1993.7 | 1832.1 | 1685.0 | 1537.9 | 1398.0 | 1292.4 | 1271.7 |
| 42.5° | 5896.3 | 5606.6 | 3949.5 | 2289.7 | 1819.5 | 1703.1 | 1546.0 | 1363.7 | 1230.2 | 1155.2 | 1144.4 |
| 45° | 6445.0 | 5962.2 | 3694.1 | 1975.7 | 1648.0 | 1574.0 | 1396.2 | 1228.4 | 1145.3 | 1090.3 | 1081.2 |
| 47.5° | 7071.4 | 6361.1 | 3426.0 | 1720.2 | 1502.7 | 1453.1 | 1276.2 | 1167.9 | 1102.0 | 1058.7 | 1050.6 |
| 50° | 7841.2 | 6811.4 | 3141.7 | 1510.8 | 1356.5 | 1307.8 | 1219.3 | 1134.5 | 1082.1 | 1048.7 | 1040.6 |
| 52.5° | 8709.5 | 7319.6 | 2936.9 | 1345.7 | 1235.6 | 1200.4 | 1189.5 | 1116.4 | 1074.0 | 1048.7 | 1040.6 |
| 55° | 9644.5 | 7836.7 | 2715.7 | 1206.7 | 1130.9 | 1140.8 | 1169.7 | 1118.2 | 1089.4 | 1058.7 | 1046.9 |
| 57.5° | 10580.4 | 8371.0 | 2469.3 | 1089.4 | 1047.8 | 1096.6 | 1156.1 | 1121.9 | 1097.5 | 1067.7 | 1056.9 |
| 60° | 11320.5 | 8709.5 | 2087.6 | 991.0 | 982.0 | 1047.8 | 1123.7 | 1094.8 | 1063.2 | 1064.1 | 1062.3 |
| 62.5° | 11666.2 | 8691.4 | 1666.1 | 903.4 | 916.1 | 982.0 | 1071.3 | 1052.4 | 1026.2 | 1061.4 | 1064.1 |
| 65° | 11472.1 | 8258.2 | 1296.9 | 824.0 | 845.7 | 913.4 | 1017.2 | 1031.6 | 1040.6 | 1108.3 | 1117.3 |
| 67.5° | 10658.0 | 7415.2 | 1004.5 | 754.5 | 781.6 | 866.4 | 1022.6 | 1123.7 | 1135.4 | 1206.7 | 1205.8 |
| 69° | *9816.0* | *6624.6* | *872.8* | *718.4* | *750.0* | *878.2* | *1093.0* | *1182.3* | *1138.1* | *1213.9* | *1203.1* |
| 70° | 9110.2 | 5999.2 | 802.4 | 694.1 | 735.6 | 898.9 | 1139.9 | 1181.4 | 1124.6 | 1189.5 | 1171.5 |
| 72.5° | 7016.3 | 4315.9 | 680.5 | 648.9 | 686.8 | 860.1 | 1153.4 | 1155.2 | 1093.0 | 1105.6 | 1074.9 |
| 75° | 4812.3 | 2727.5 | 593.9 | 587.6 | 612.8 | 775.3 | 1110.1 | 1103.8 | 1010.8 | 992.8 | 967.5 |
| 77.5° | 2653.5 | 1385.4 | 504.5 | 528.9 | 546.0 | 686.8 | 1009.0 | 1000.0 | 923.3 | 885.4 | 876.4 |
| 80° | 1023.5 | 606.5 | 426.0 | 470.2 | 481.1 | 594.8 | 884.5 | 876.4 | 812.3 | 763.5 | 750.0 |
| 82.5° | 386.3 | 317.7 | 352.0 | 407.0 | 403.4 | 491.0 | 749.1 | 744.6 | 682.3 | 611.0 | 589.4 |
| 85° | 178.7 | 190.4 | 278.9 | 335.7 | 309.6 | 363.7 | 599.3 | 607.4 | 531.6 | 446.8 | 446.8 |
| 87.5° | 75.8 | 106.5 | 197.7 | 253.6 | 208.5 | 245.5 | 439.5 | 419.7 | 385.4 | 267.2 | 250.9 |
| 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: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

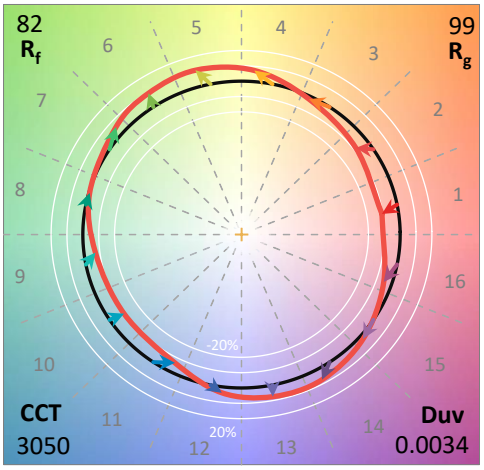
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2408-195-9 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 08/07/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | MCGRAW EDISON |
| Catalog Number: | **GALN-SB1A-830-U-5WQ** |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3050 | CRI (Ra): | 81.0 | | |
| CIE u': | 0.2476 | R1: | 79.6 | R9: | 7.1 |
| CIE v': | 0.5251 | R2: | 85.6 | R10: | 67.0 |
| Duv: | 0.0034 | R3: | 92.0 | R11: | 82.7 |
| CIE x: | 0.4383 | R4: | 82.6 | R12: | 63.2 |
| CIE y: | 0.4131 | R5: | 78.9 | R13: | 80.3 |
| CIE z: | 0.1487 | R6: | 81.7 | R14: | 95.0 |
| Peak Wavelength (nm): | 603 | R7: | 85.2 | R15: | 71.7 |
| Dominant Wavelength (nm): | 581 | R8: | 62.0 | | |
| Purity: | 55.55201 | | | | |

| | |
|---|---|
| Rf: | 81.5 |
| Rg: | 99.2 |




## Test Conditions

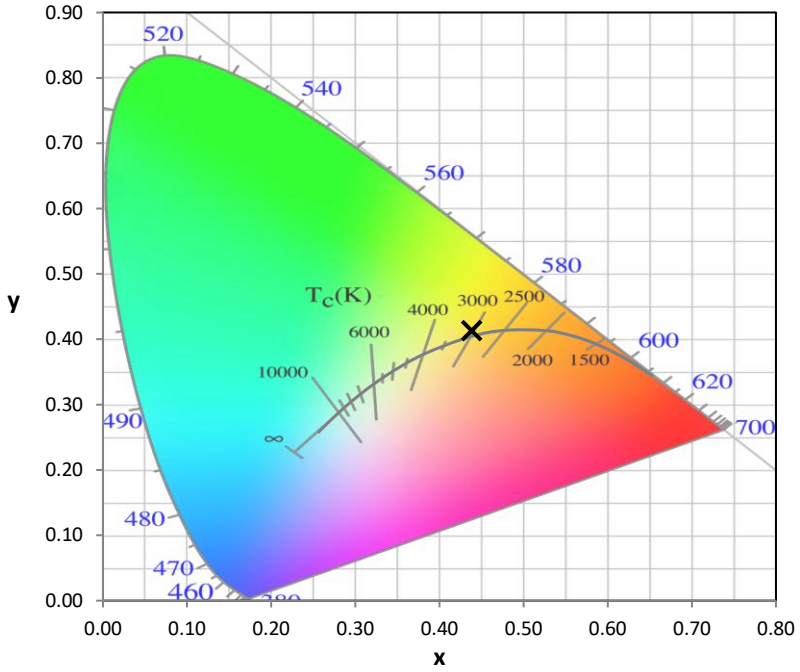
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

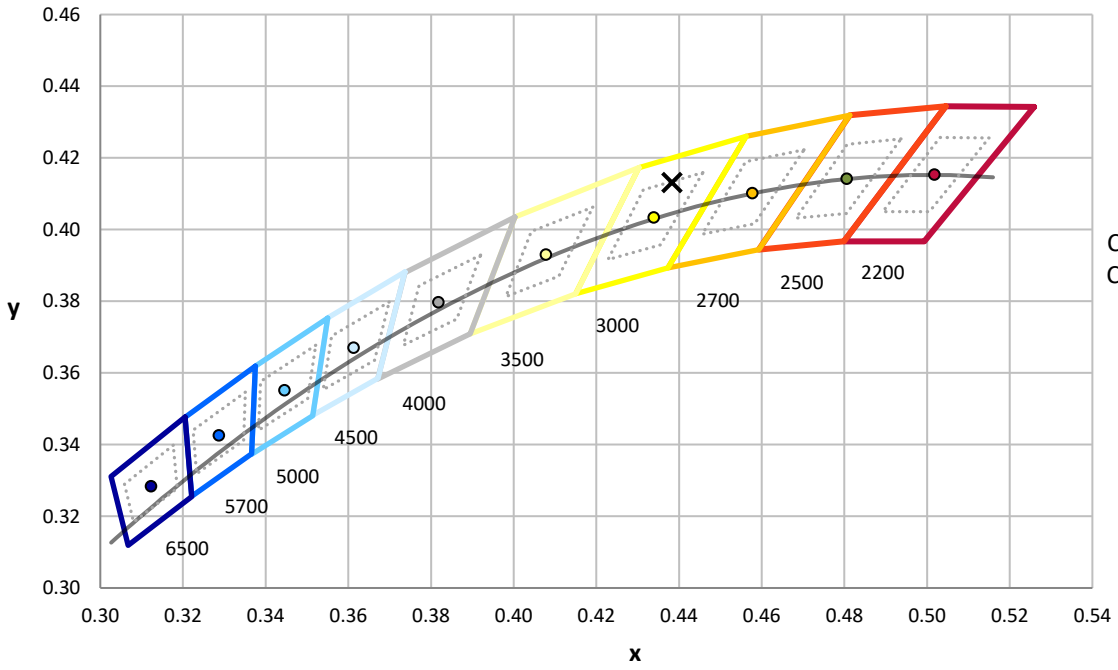
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC 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: SP1-2408-195-9

## CIE 1931 Chromaticity Diagram




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

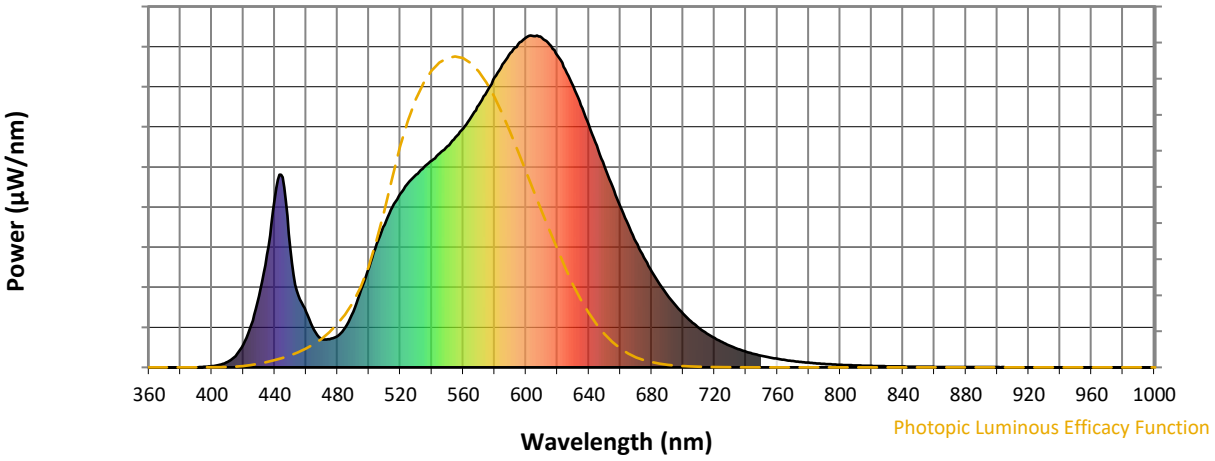



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2408-195-9

## Photopic Flux vs. Wavelength

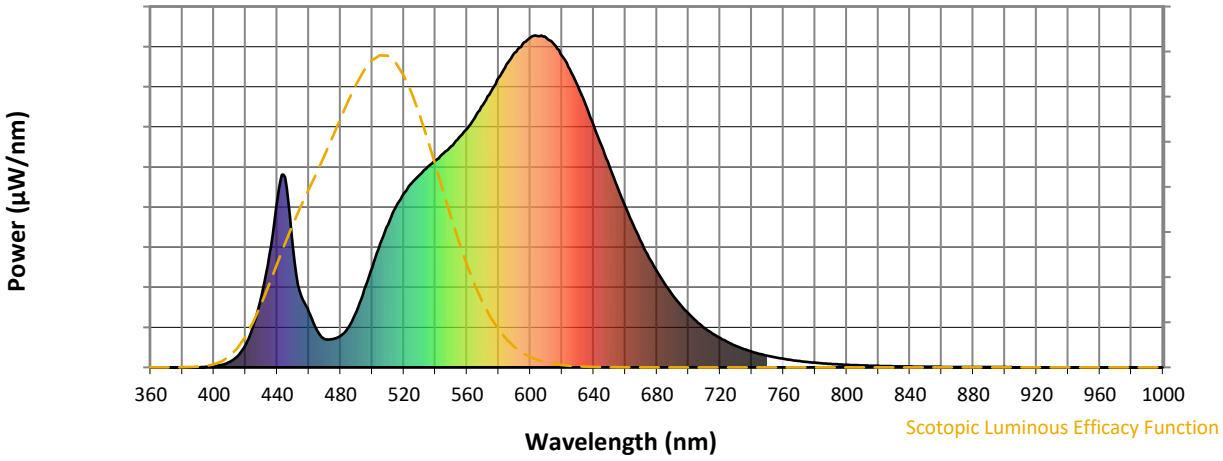



## Photopic Lumens: NR

| 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 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2408-195-9

## Scotopic Flux vs. Wavelength

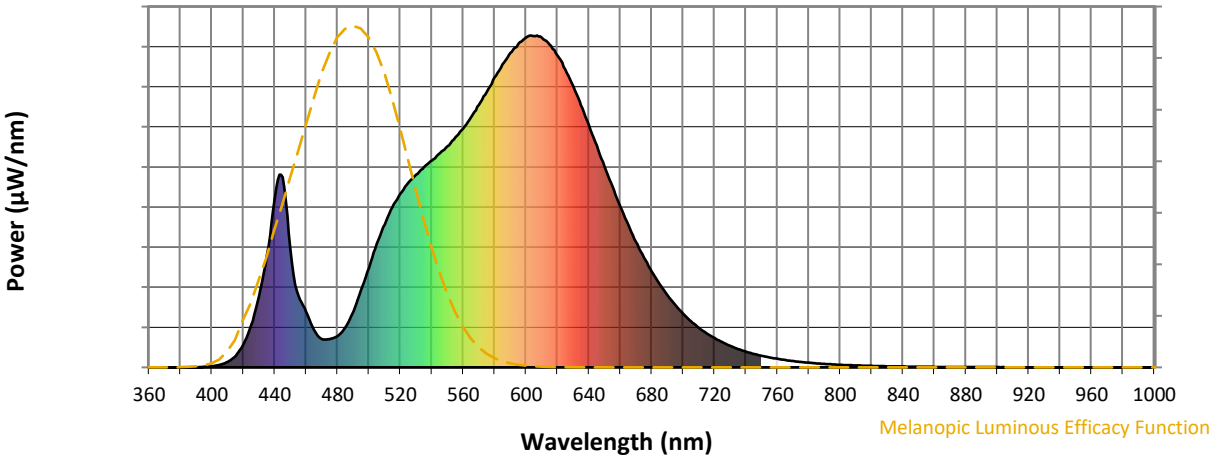



**Scotopic Lumens: NR** **S/P: 1.27**

| 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 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2408-195-9

## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.32**

| 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 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

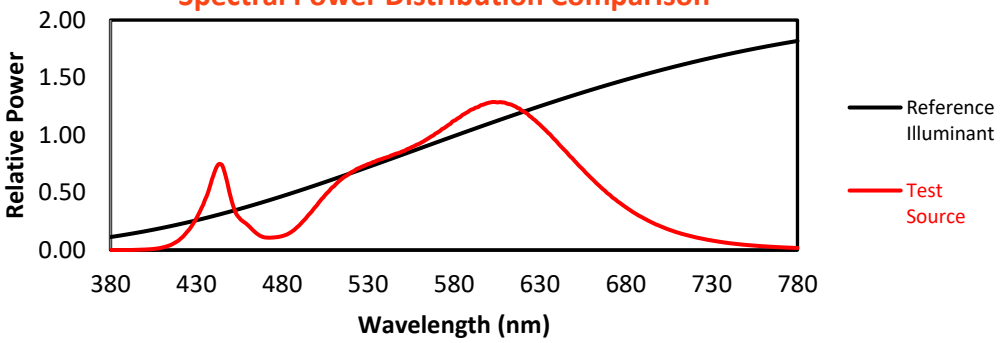
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

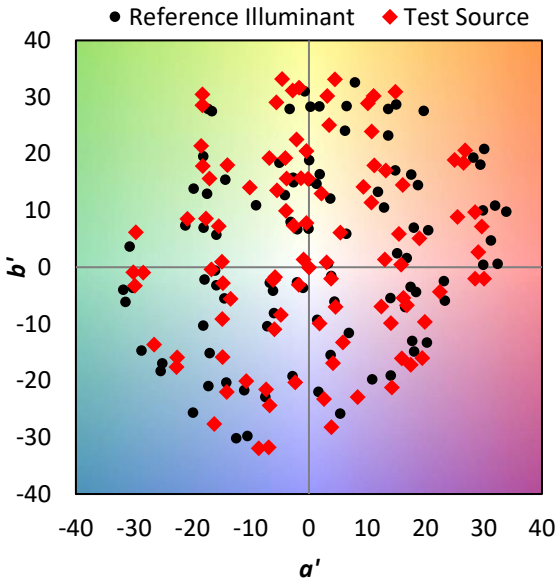
## Summary

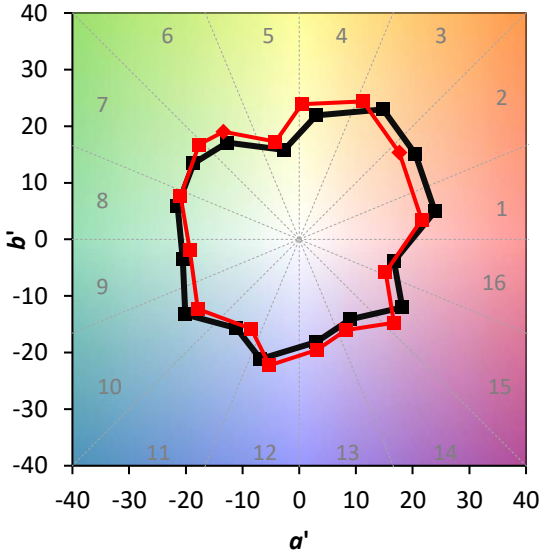
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

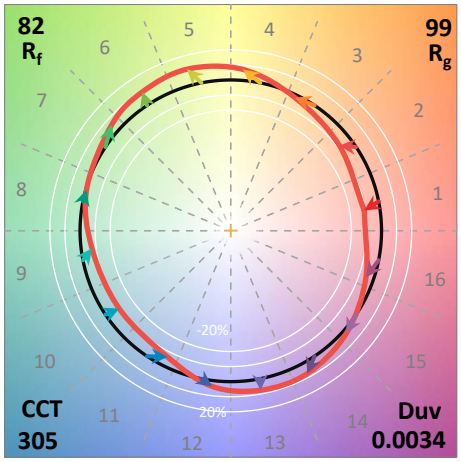
## Spectral Power Distribution Comparison

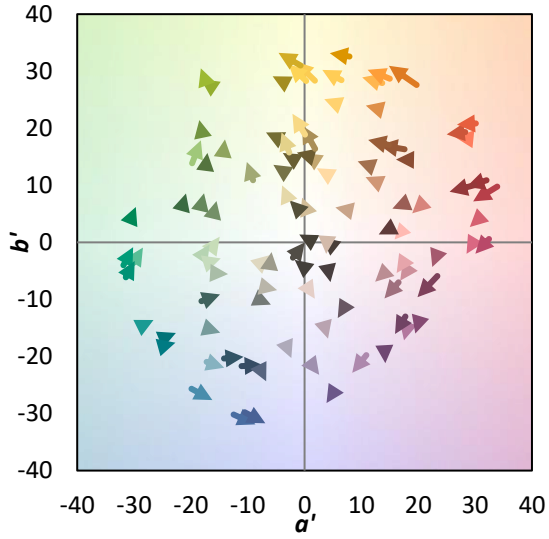



## Color Vector Graphics



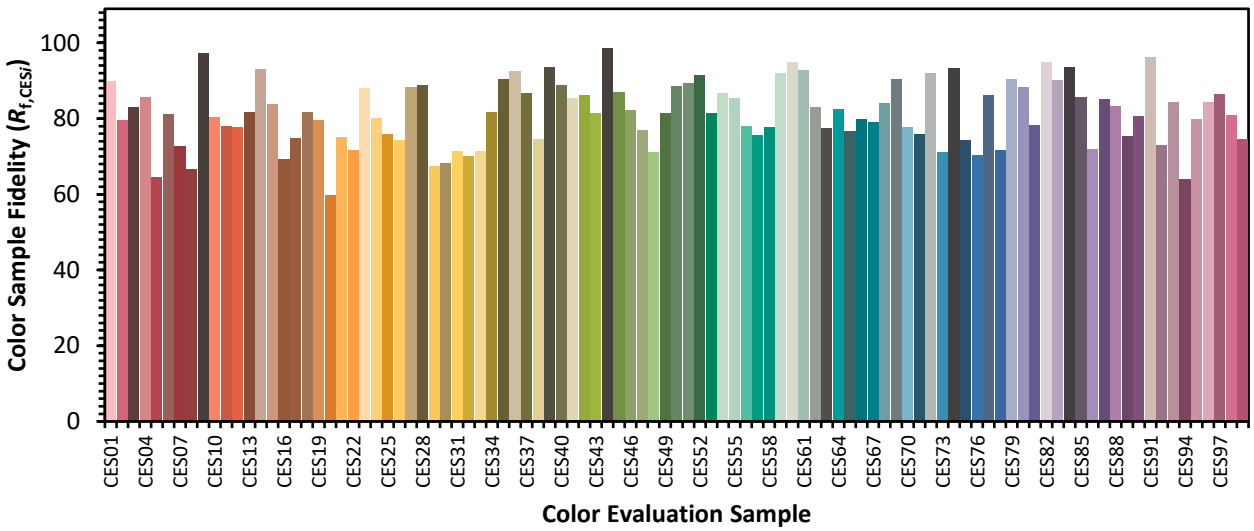



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

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

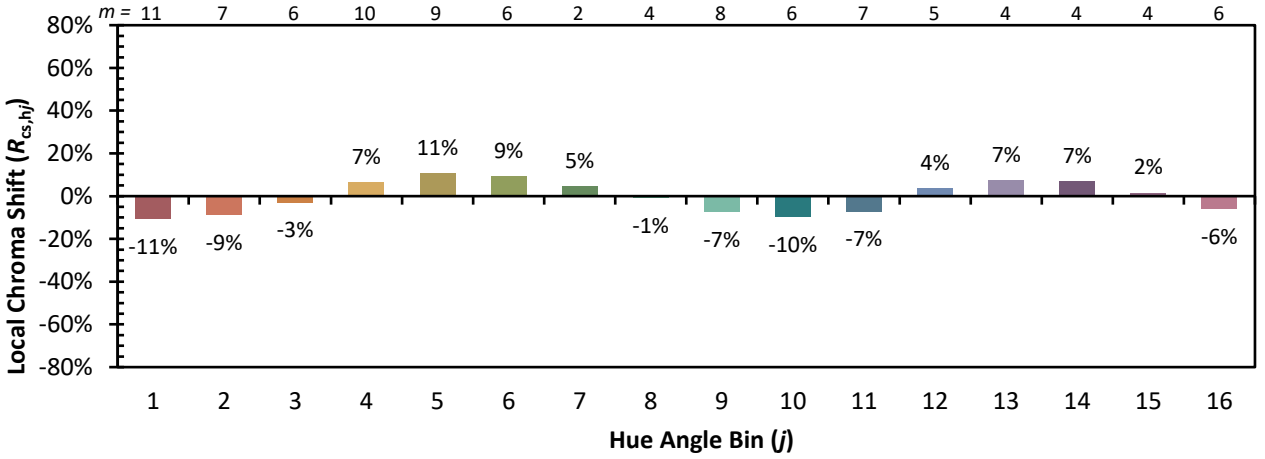
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 | |

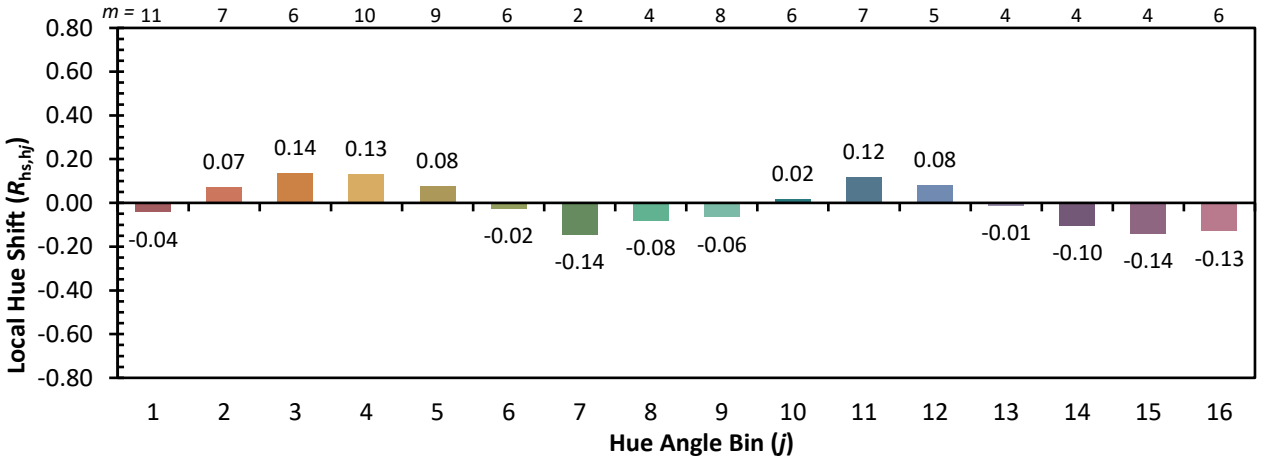


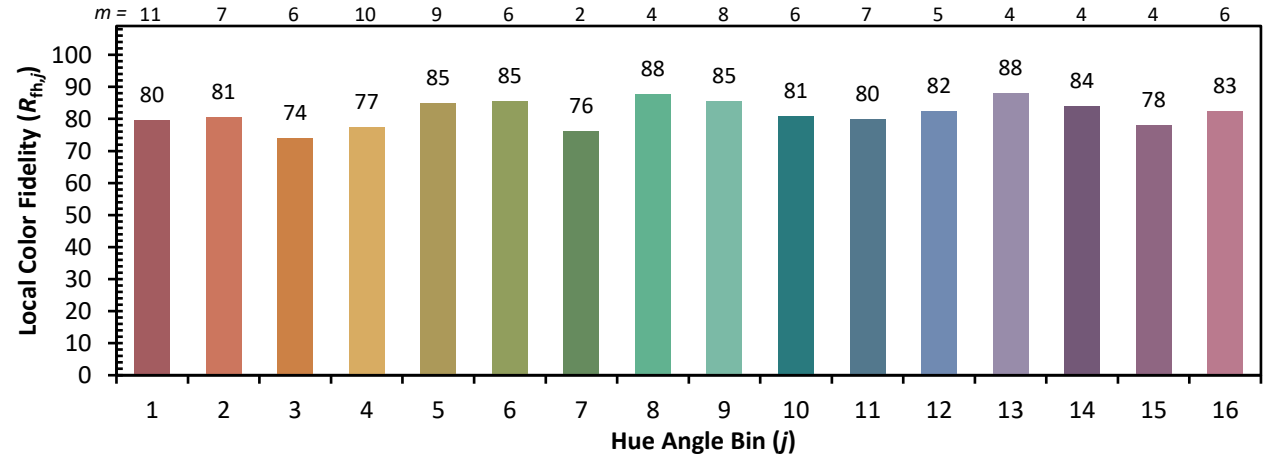
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Color Rendition by Hue-Angle Bin



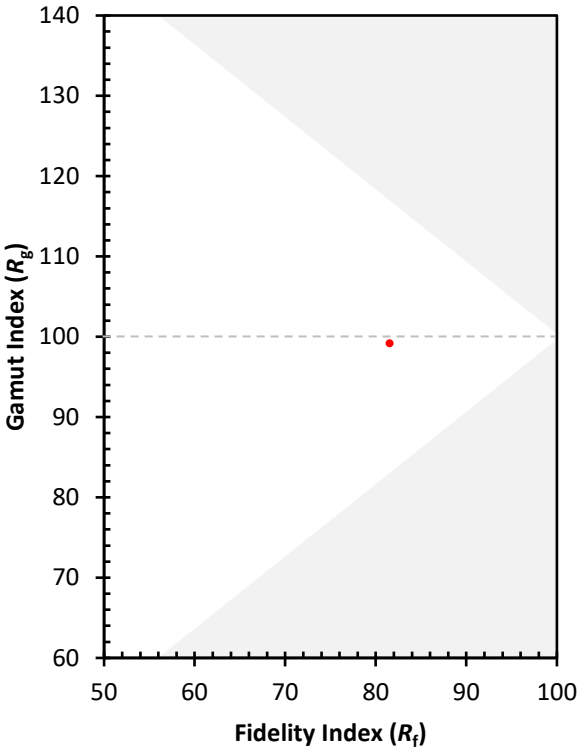



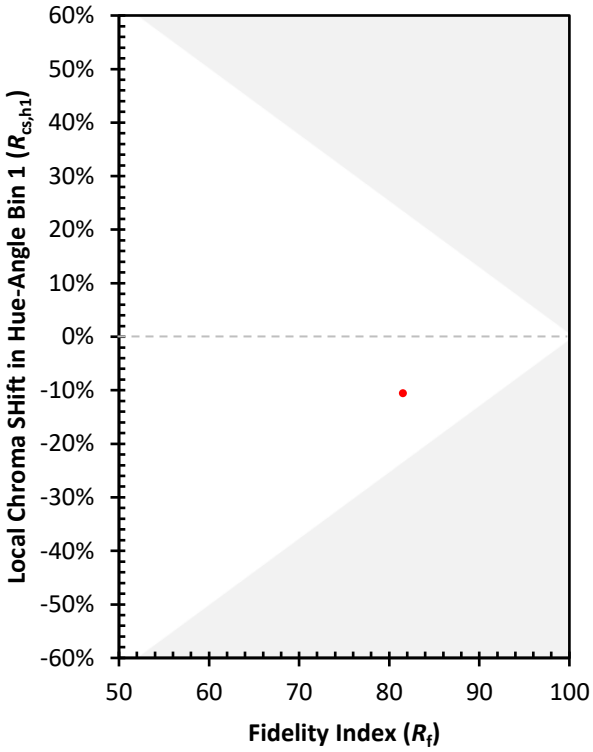



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Measure Comparisons




(END OF REPORT)