

Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



Scaled data based on original data using
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P640776

Luminaire Tested: GWS-SA5E-750-U-RW-W-GRSBK

Issue Date: 1/10/2023

Test Information

Test Method: LM-79-2019
Report Number: P640776
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-50)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 1/10/2023
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: McGRAW-EDISON
Catalog Number: GWS-SA5E-750-U-RW-W-GRSBK
Description: GALLEON WALL SLIM LUMINAIRE. (5) LIGHTSQUARES WITH 16 LEDS EACH AND RECTANGULAR WIDE OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK
Light Source: (80) 5000K CCT, 70 CRI LEDS
Ballast/Driver: -

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 24888.5 lumens
Efficiency: N/A
Efficacy: 92.3 lumens/watt
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')
IES Classification: Type V - Short
BUG Rating: B5 - U0 - G1

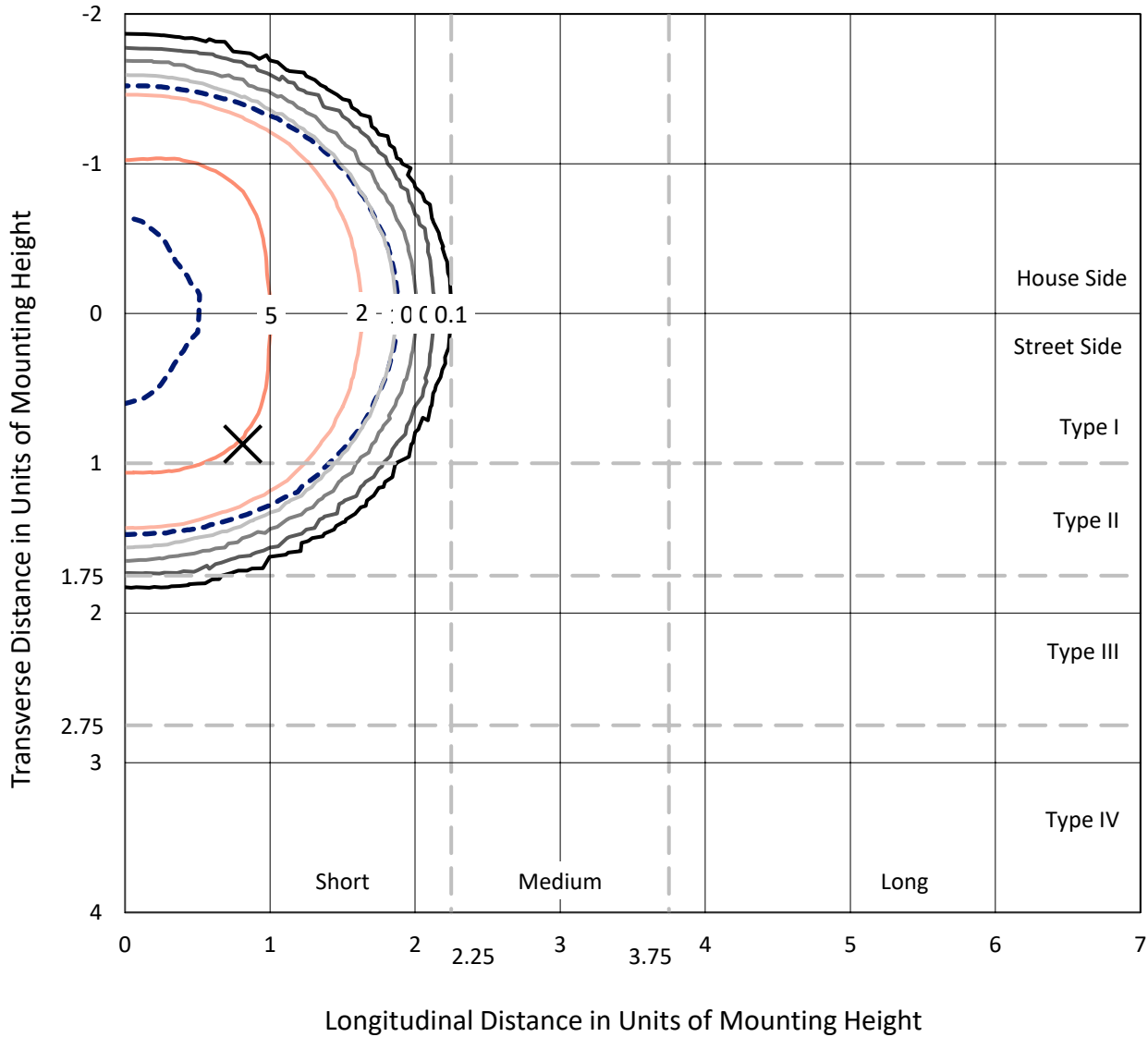
Input Watts (W): 269.6
Input Voltage (V): 120
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 0
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



REPORT NUMBER: P640776
 CATALOG NUMBER: GWS-SA5E-750-U-RW-W-GRSBK

Iso-Footcandle Lines of Horizontal Illumination

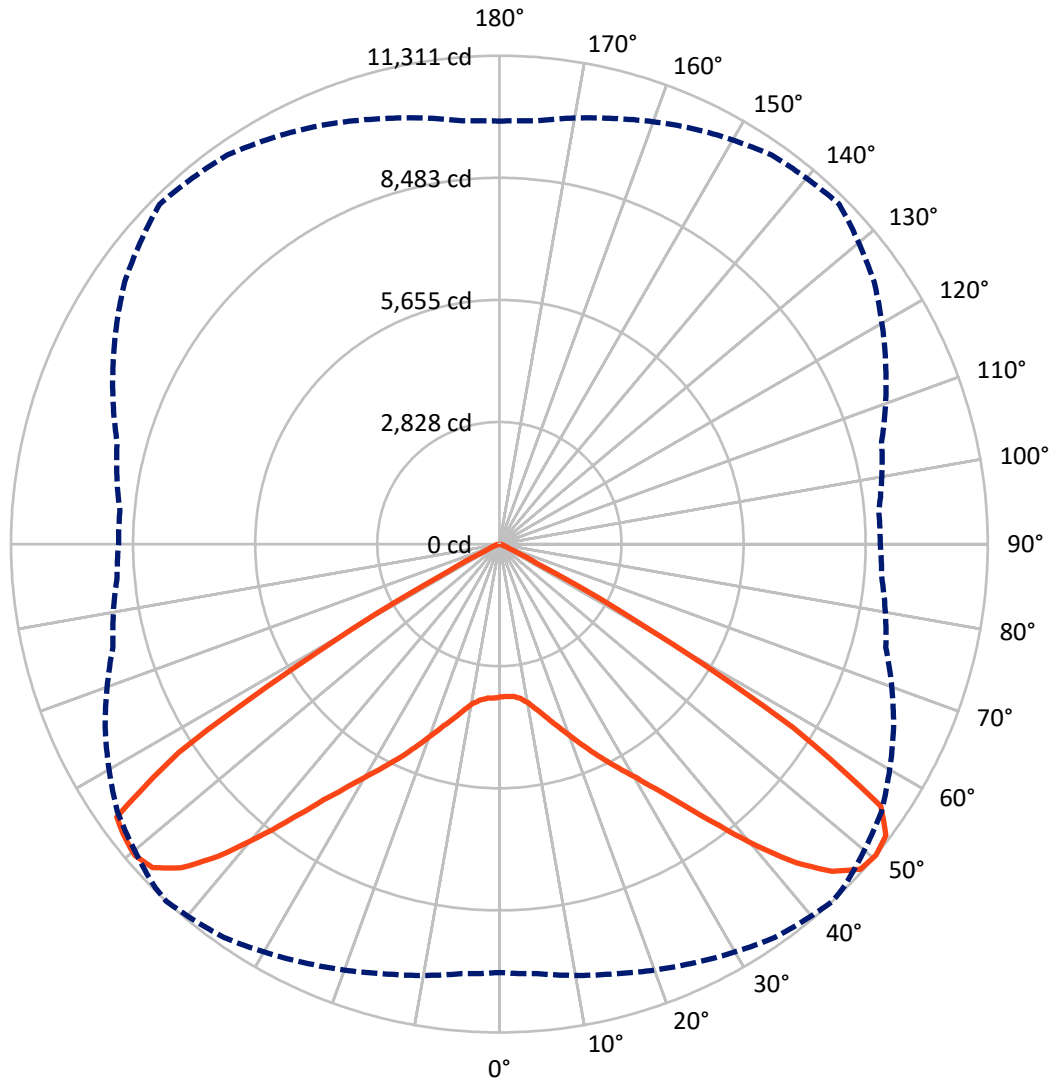
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 6.8 fc
 Type V - Short - N/A

REPORT NUMBER: P640776
CATALOG NUMBER: GWS-SA5E-750-U-RW-W-GRSBK

Luminous Intensity Polar Plot



— Vertical Plane Through 43-Deg Lateral - - - Horizontal Cone Through 50-Deg Vertical

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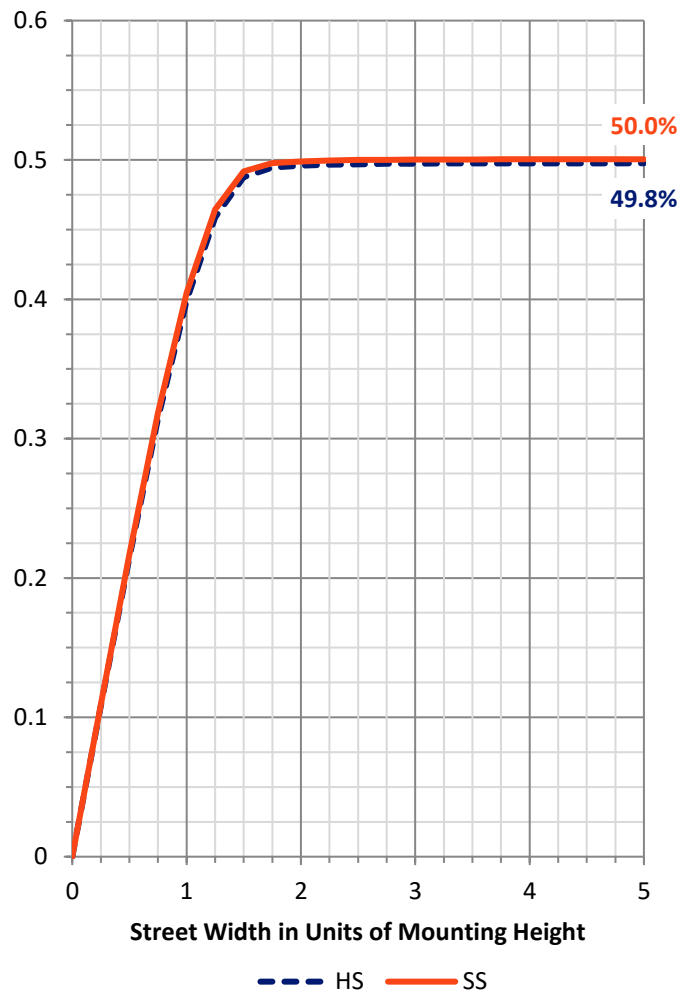
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|---------|
| House Side | Lumens | 12443.9 | 0.0 | 12443.9 |
| | % Fixture | 50.0 | 0.0 | 50.0 |
| Street Side | Lumens | 12444.6 | 0.0 | 12444.6 |
| | % Fixture | 50.0 | 0.0 | 50.0 |
| Total | Lumens | 24888.5 | 0.0 | 24888.5 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 348.6 | 1.4 |
| 10°-20° | 1199.7 | 4.8 |
| 20°-30° | 2427.1 | 9.8 |
| 30°-40° | 4503.1 | 18.1 |
| 40°-50° | 7475.0 | 30.0 |
| 50°-60° | 7628.5 | 30.7 |
| 60°-70° | 1251.0 | 5.0 |
| 70°-80° | 54.8 | 0.2 |
| 80°-90° | 0.8 | 0.0 |
| 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° | 24888.5 | 100.0 |
| 0°-180° | 24888.5 | 100.0 |

Coefficient of Utilization



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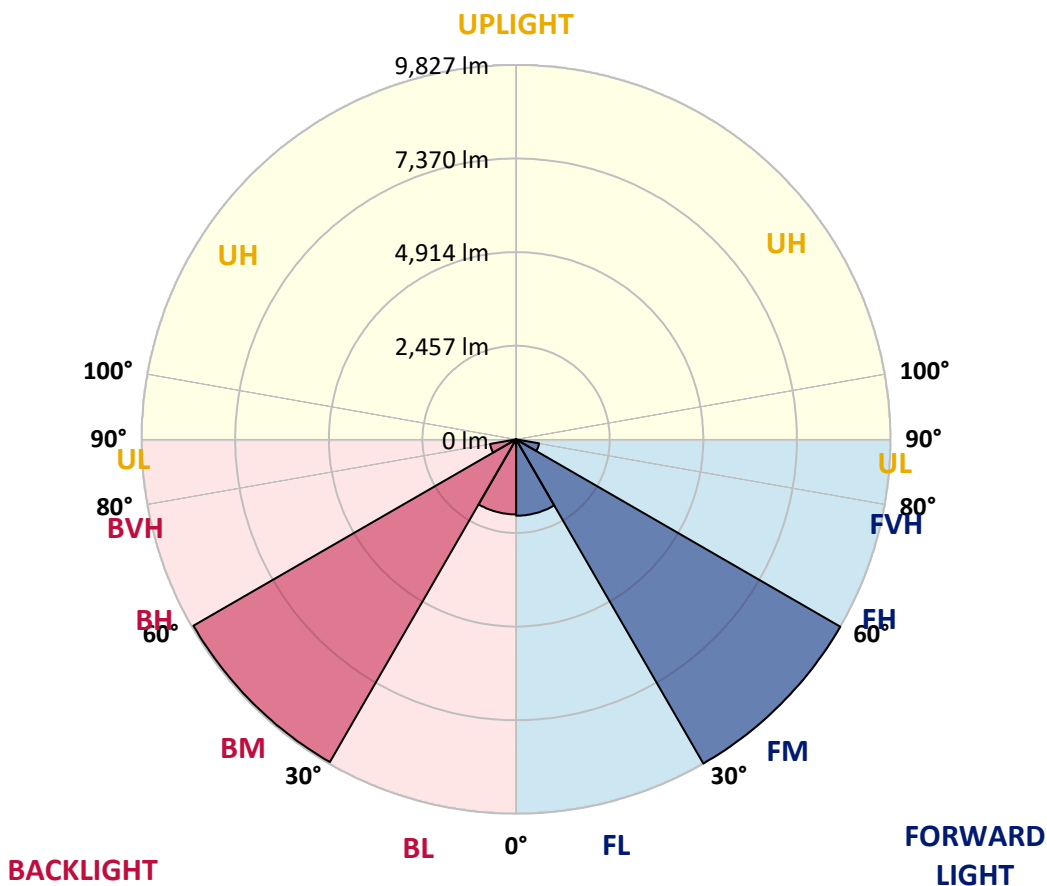
CATALOG NUMBER: GWS-SA5E-750-U-RW-W-GRSBK

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 2005.1 | 8.1 | | | |
| FM (30°-60°) | 9827.2 | 39.5 | | | |
| FH (60°-80°) | 612.0 | 2.5 | | | G0/660 |
| FVH (80°-90°) | 0.3 | 0.0 | | | G0/10 |
| BL (0°-30°) | 1970.3 | 7.9 | B3/2500 | | |
| BM (30°-60°) | 9779.4 | 39.3 | B5 | | |
| BH (60°-80°) | 693.8 | 2.8 | B2/1000 | | G1/1800 |
| BVH (80°-90°) | 0.5 | 0.0 | | | G0/10 |
| UL (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH (100°-180°) | 0.0 | 0.0 | | U0/0 | |

BUG Rating: B5-U0-G1

Type V Short





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CATALOG NUMBER: GWS-SA5E-750-U-RW-W-GRSBK

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 43° | 45° | 55° | 65° | 75° | 85° |
|-------|--------|--------|---------|---------|---------|---------|---------|---------|---------|--------|--------|
| 0° | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 |
| 2.5° | 3473.9 | 3482.2 | 3493.2 | 3504.2 | 3518.0 | 3531.7 | 3540.0 | 3564.8 | 3559.3 | 3581.3 | 3581.3 |
| 5° | 3435.4 | 3443.7 | 3457.4 | 3482.2 | 3512.5 | 3542.7 | 3564.8 | 3614.3 | 3641.8 | 3685.9 | 3702.4 |
| 7.5° | 3454.7 | 3465.7 | 3482.2 | 3520.7 | 3567.5 | 3614.3 | 3639.1 | 3718.9 | 3774.0 | 3856.6 | 3903.4 |
| 10° | 3518.0 | 3529.0 | 3556.5 | 3622.6 | 3683.1 | 3749.2 | 3779.5 | 3881.3 | 3969.4 | 4082.3 | 4148.3 |
| 12.5° | 3589.5 | 3603.3 | 3658.4 | 3757.5 | 3862.1 | 3950.2 | 3991.4 | 4104.3 | 4195.1 | 4321.8 | 4426.4 |
| 15° | 3663.9 | 3685.9 | 3771.2 | 3917.1 | 4065.8 | 4184.1 | 4228.2 | 4349.3 | 4440.1 | 4575.0 | 4693.4 |
| 17.5° | 3837.3 | 3862.1 | 3958.4 | 4115.3 | 4319.0 | 4456.7 | 4495.2 | 4621.8 | 4690.6 | 4781.5 | 4905.3 |
| 20° | 4054.8 | 4101.5 | 4219.9 | 4409.9 | 4632.8 | 4765.0 | 4792.5 | 4916.4 | 4910.8 | 4949.4 | 5056.7 |
| 22.5° | 4324.5 | 4357.6 | 4486.9 | 4712.7 | 4963.2 | 5109.0 | 5172.4 | 5224.7 | 5155.8 | 5122.8 | 5191.6 |
| 25° | 4605.3 | 4643.8 | 4784.2 | 5032.0 | 5312.7 | 5480.7 | 5533.0 | 5574.3 | 5464.1 | 5340.3 | 5348.5 |
| 27.5° | 4968.7 | 4996.2 | 5133.8 | 5398.1 | 5678.9 | 5868.8 | 5915.6 | 5987.2 | 5841.3 | 5643.1 | 5588.0 |
| 30° | 5400.8 | 5428.4 | 5574.3 | 5852.3 | 6130.3 | 6292.7 | 6364.3 | 6452.4 | 6292.7 | 6045.0 | 5981.7 |
| 32.5° | 5907.3 | 5934.9 | 6122.0 | 6408.3 | 6636.8 | 6813.0 | 6881.8 | 6975.4 | 6848.8 | 6570.7 | 6499.2 |
| 35° | 6512.9 | 6529.4 | 6749.7 | 7060.7 | 7303.0 | 7473.6 | 7520.4 | 7630.5 | 7490.1 | 7212.1 | 7173.6 |
| 37.5° | 7214.9 | 7234.1 | 7473.6 | 7834.2 | 8082.0 | 8271.9 | 8346.2 | 8376.5 | 8205.9 | 7894.8 | 7864.5 |
| 40° | 7985.6 | 8048.9 | 8282.9 | 8671.1 | 8949.1 | 9188.6 | 9254.6 | 9152.8 | 8913.3 | 8489.4 | 8434.3 |
| 42.5° | 8789.4 | 8844.5 | 9106.0 | 9527.2 | 9849.2 | 10094.2 | 10097.0 | 9876.8 | 9469.4 | 8883.0 | 8800.4 |
| 45° | 9458.3 | 9480.4 | 9818.9 | 10242.9 | 10639.3 | 10812.7 | 10829.2 | 10430.0 | 9816.2 | 9111.5 | 8935.3 |
| 47.5° | 9918.0 | 9953.8 | 10248.4 | 10655.8 | 11093.5 | 11250.4 | 11217.3 | 10719.1 | 9981.4 | 9260.1 | 8968.4 |
| 50° | 9923.5 | 9984.1 | 10303.4 | 10697.1 | 11121.0 | 11310.9 | 11264.1 | 10801.7 | 10074.9 | 9265.6 | 8888.5 |
| 52.5° | 9045.4 | 9144.5 | 9664.8 | 10234.6 | 10884.2 | 11209.1 | 11220.1 | 10909.0 | 10039.2 | 9177.6 | 8817.0 |
| 55° | 6824.0 | 6931.3 | 7586.5 | 8558.2 | 9813.4 | 10719.1 | 10876.0 | 10782.4 | 9997.9 | 9216.1 | 8943.6 |
| 57.5° | 3611.6 | 3529.0 | 3892.3 | 4855.8 | 6433.1 | 8035.2 | 8494.9 | 9243.6 | 9538.2 | 9262.9 | 9177.6 |
| 60° | 787.3 | 839.6 | 1117.6 | 1505.7 | 2510.5 | 3779.5 | 4228.2 | 5510.9 | 7035.9 | 7713.1 | 8203.1 |
| 62.5° | 338.6 | 333.1 | 346.8 | 393.6 | 575.3 | 957.9 | 1169.9 | 1910.4 | 3014.2 | 4140.1 | 4902.6 |
| 65° | 278.0 | 280.8 | 291.8 | 291.8 | 272.5 | 275.3 | 289.0 | 437.7 | 704.7 | 988.2 | 1326.8 |
| 67.5° | 209.2 | 212.0 | 231.2 | 236.7 | 223.0 | 198.2 | 195.4 | 165.2 | 173.4 | 217.5 | 225.7 |
| 70° | 132.1 | 132.1 | 143.1 | 148.6 | 148.6 | 137.6 | 134.9 | 118.4 | 115.6 | 132.1 | 148.6 |
| 72.5° | 71.6 | 71.6 | 77.1 | 79.8 | 77.1 | 74.3 | 74.3 | 71.6 | 68.8 | 79.8 | 101.9 |
| 75° | 30.3 | 30.3 | 33.0 | 33.0 | 30.3 | 30.3 | 30.3 | 30.3 | 30.3 | 35.8 | 55.1 |
| 77.5° | 5.5 | 8.3 | 11.0 | 8.3 | 5.5 | 5.5 | 5.5 | 8.3 | 8.3 | 11.0 | 16.5 |
| 80° | 2.8 | 2.8 | 5.5 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 | 2.8 | 2.8 |
| 82.5° | 2.8 | 2.8 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 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 |



REPORT NUMBER: P640776
 CATALOG NUMBER: GWS-SA5E-750-U-RW-W-GRSBK

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|---------|---------|---------|---------|---------|--------|--------|
| 0° | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 | 3540.0 |
| 2.5° | 3600.6 | 3570.3 | 3581.3 | 3586.8 | 3578.5 | 3573.0 | 3542.7 | 3534.5 | 3520.7 | 3498.7 | 3493.2 |
| 5° | 3721.7 | 3696.9 | 3694.1 | 3677.6 | 3639.1 | 3592.3 | 3534.5 | 3509.7 | 3482.2 | 3454.7 | 3449.2 |
| 7.5° | 3925.4 | 3895.1 | 3875.8 | 3820.8 | 3732.7 | 3658.4 | 3562.0 | 3509.7 | 3473.9 | 3438.1 | 3429.9 |
| 10° | 4186.9 | 4151.1 | 4096.0 | 3994.2 | 3875.8 | 3768.5 | 3655.6 | 3586.8 | 3531.7 | 3482.2 | 3479.4 |
| 12.5° | 4464.9 | 4426.4 | 4327.3 | 4197.9 | 4054.8 | 3955.7 | 3812.5 | 3716.2 | 3633.6 | 3559.3 | 3551.0 |
| 15° | 4756.7 | 4709.9 | 4575.0 | 4420.9 | 4288.7 | 4186.9 | 4030.0 | 3875.8 | 3749.2 | 3641.8 | 3630.8 |
| 17.5° | 4979.7 | 4921.9 | 4762.2 | 4646.6 | 4539.2 | 4434.6 | 4258.5 | 4054.8 | 3886.8 | 3757.5 | 3727.2 |
| 20° | 5120.1 | 5065.0 | 4913.6 | 4850.3 | 4800.7 | 4726.4 | 4517.2 | 4305.3 | 4118.1 | 3958.4 | 3930.9 |
| 22.5° | 5254.9 | 5188.9 | 5056.7 | 5056.7 | 5095.3 | 5065.0 | 4839.3 | 4597.0 | 4376.8 | 4192.4 | 4151.1 |
| 25° | 5406.3 | 5354.0 | 5260.4 | 5337.5 | 5433.9 | 5431.1 | 5199.9 | 4897.1 | 4643.8 | 4437.4 | 4396.1 |
| 27.5° | 5626.6 | 5574.3 | 5541.2 | 5687.1 | 5808.2 | 5800.0 | 5546.7 | 5219.2 | 4952.1 | 4748.4 | 4709.9 |
| 30° | 6014.7 | 5965.1 | 5929.4 | 6105.5 | 6259.7 | 6201.9 | 5923.8 | 5607.3 | 5337.5 | 5106.3 | 5078.8 |
| 32.5° | 6532.2 | 6479.9 | 6433.1 | 6609.3 | 6746.9 | 6672.6 | 6408.3 | 6111.0 | 5800.0 | 5574.3 | 5519.2 |
| 35° | 7212.1 | 7102.0 | 7055.2 | 7264.4 | 7322.2 | 7239.6 | 6986.4 | 6724.9 | 6394.6 | 6135.8 | 6100.0 |
| 37.5° | 7914.1 | 7784.7 | 7751.7 | 7933.3 | 8026.9 | 7996.6 | 7699.4 | 7426.8 | 7069.0 | 6782.7 | 6741.4 |
| 40° | 8514.2 | 8395.8 | 8338.0 | 8621.5 | 8833.5 | 8852.7 | 8585.7 | 8252.6 | 7831.5 | 7534.2 | 7459.9 |
| 42.5° | 8866.5 | 8764.7 | 8750.9 | 9191.3 | 9538.2 | 9785.9 | 9466.6 | 9122.5 | 8679.3 | 8343.5 | 8282.9 |
| 45° | 8946.3 | 8880.3 | 8995.9 | 9574.0 | 10113.5 | 10564.9 | 10292.4 | 9929.1 | 9450.1 | 9095.0 | 9037.2 |
| 47.5° | 8938.1 | 8916.1 | 9122.5 | 9772.1 | 10454.8 | 11010.9 | 10876.0 | 10465.8 | 10003.4 | 9631.8 | 9576.7 |
| 50° | 8819.7 | 8822.5 | 9166.6 | 9871.2 | 10592.5 | 11132.0 | 10997.1 | 10617.2 | 10204.3 | 9838.2 | 9794.2 |
| 52.5° | 8772.9 | 8756.4 | 9084.0 | 9841.0 | 10732.8 | 11076.9 | 10774.1 | 10347.5 | 9887.8 | 9436.3 | 9370.3 |
| 55° | 8938.1 | 8896.8 | 9095.0 | 9816.2 | 10749.4 | 11046.7 | 10248.4 | 9323.5 | 8382.0 | 7848.0 | 7804.0 |
| 57.5° | 9185.8 | 9141.8 | 9235.4 | 9634.5 | 9887.8 | 9185.8 | 7542.4 | 6050.5 | 5081.5 | 4671.4 | 4492.4 |
| 60° | 8203.1 | 8172.8 | 8101.2 | 7619.5 | 6535.0 | 4930.1 | 3358.3 | 2141.6 | 1538.8 | 1244.2 | 1244.2 |
| 62.5° | 5089.8 | 5048.5 | 4660.4 | 3462.9 | 2516.0 | 1456.2 | 801.0 | 501.0 | 379.9 | 355.1 | 352.3 |
| 65° | 1428.7 | 1420.4 | 1175.4 | 831.3 | 528.5 | 327.6 | 289.0 | 294.5 | 289.0 | 280.8 | 278.0 |
| 67.5° | 214.7 | 236.7 | 236.7 | 192.7 | 184.4 | 206.5 | 242.2 | 258.8 | 245.0 | 231.2 | 225.7 |
| 70° | 137.6 | 148.6 | 143.1 | 123.9 | 132.1 | 154.2 | 173.4 | 176.2 | 167.9 | 154.2 | 151.4 |
| 72.5° | 96.3 | 107.4 | 88.1 | 79.8 | 82.6 | 90.8 | 99.1 | 99.1 | 96.3 | 90.8 | 85.3 |
| 75° | 57.8 | 57.8 | 41.3 | 38.5 | 38.5 | 41.3 | 41.3 | 46.8 | 46.8 | 44.0 | 41.3 |
| 77.5° | 19.3 | 22.0 | 13.8 | 11.0 | 11.0 | 11.0 | 13.8 | 16.5 | 16.5 | 13.8 | 11.0 |
| 80° | 2.8 | 5.5 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 5.5 | 5.5 | 2.8 |
| 82.5° | 2.8 | 2.8 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 | 2.8 | 2.8 | 2.8 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 | 2.8 |
| 87.5° | 0.0 | 0.0 | 0.0 | 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 |

Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269



LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

Test Information

Test Method: LM-79-2008
 Report Number: SP1-1908-441-4-R4
 Test Lab: COOPER LIGHTING SOLUTIONS
 Photometer: SP1 - 76IN SPHERE
 Measurement Geometry: 4π
 Issue Date: 10/28/2024
 Manufacturer: COOPER LIGHTING SOLUTIONS
 Product Line: MCGRAW-EDISON
 Catalog Number: **SA1C-750-U-5WQ**
 Description: MCGRAW EDISON ROADWAY AND AREA LUMINAIRE

THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

Spectral Parameters

CCT (K): 4884
 CIE u': 0.2101
 CIE v': 0.4904
 Duv: 0.0037
 CIE x: 0.3493
 CIE y: 0.3624
 CIE z: 0.2884
 Peak Wavelength (nm): 444
 Dominant Wavelength (nm): 571
 Purity: 13.7
 Rf: 74.9
 Rg: 96.3

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 73.5 | | |
| R1: | 70.5 | R9: | -28.4 |
| R2: | 77.7 | R10: | 48.6 |
| R3: | 84.6 | R11: | 73.2 |
| R4: | 74.7 | R12: | 50.7 |
| R5: | 71.9 | R13: | 71.2 |
| R6: | 70.7 | R14: | 91.4 |
| R7: | 81.2 | | |
| R8: | 56.9 | | |



Test Conditions

Stabilization Time: 240M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.0./44%
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-4-R4

| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/28/2019 | 12/28/2019 |
| Power Meter | IN0071 | 12/5/2018 | 12/5/2019 |
| AC Power Source | IN0063 | 12/5/2018 | 12/5/2019 |
| DC Power Source | IN0208 | 12/5/2018 | 12/5/2019 |
| Sphere Thermometer | IN0085 | 12/5/2018 | 12/5/2019 |
| Room Thermometer | IN0046 | 12/5/2018 | 12/5/2019 |

REPORT NUMBER: SP1-1908-441-4-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 5000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-4-R4

Photopic Flux vs. Wavelength



#####

| λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) | λ (nm) | Power ($\mu\text{W}/\text{nm}$) | Lumens (ϕ/nm) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360 | 2945 | NR | 490 | 37941 | NR | 620 | 88803 | NR | 750 | 3908 | NR | 880 | 2997 | NR |
| 365 | 2596 | NR | 495 | 48525 | NR | 625 | 80578 | NR | 755 | 3988 | NR | 885 | 2927 | NR |
| 370 | 2732 | NR | 500 | 60609 | NR | 630 | 73127 | NR | 760 | 3335 | NR | 890 | 2649 | NR |
| 375 | 2894 | NR | 505 | 72036 | NR | 635 | 66244 | NR | 765 | 3438 | NR | 895 | 2828 | NR |
| 380 | 2822 | NR | 510 | 82168 | NR | 640 | 59440 | NR | 770 | 3427 | NR | 900 | 1407 | NR |
| 385 | 2394 | NR | 515 | 90898 | NR | 645 | 52864 | NR | 775 | 2759 | NR | 905 | 2224 | NR |
| 390 | 2370 | NR | 520 | 97142 | NR | 650 | 47085 | NR | 780 | 2340 | NR | 910 | 2905 | NR |
| 395 | 2267 | NR | 525 | 103255 | NR | 655 | 41789 | NR | 785 | 2412 | NR | 915 | 3350 | NR |
| 400 | 2262 | NR | 530 | 106697 | NR | 660 | 37064 | NR | 790 | 1999 | NR | 920 | 3114 | NR |
| 405 | 3000 | NR | 535 | 110081 | NR | 665 | 32299 | NR | 795 | 2054 | NR | 925 | 2834 | NR |
| 410 | 5324 | NR | 540 | 112494 | NR | 670 | 28142 | NR | 800 | 2331 | NR | 930 | 2271 | NR |
| 415 | 10725 | NR | 545 | 115513 | NR | 675 | 24505 | NR | 805 | 2648 | NR | 935 | 2228 | NR |
| 420 | 22128 | NR | 550 | 117203 | NR | 680 | 21162 | NR | 810 | 2485 | NR | 940 | 2833 | NR |
| 425 | 44095 | NR | 555 | 119753 | NR | 685 | 18400 | NR | 815 | 2409 | NR | 945 | 2941 | NR |
| 430 | 77002 | NR | 560 | 122602 | NR | 690 | 16065 | NR | 820 | 2221 | NR | 950 | 2323 | NR |
| 435 | 119881 | NR | 565 | 124314 | NR | 695 | 13860 | NR | 825 | 1562 | NR | 955 | 1667 | NR |
| 440 | 164454 | NR | 570 | 126775 | NR | 700 | 12177 | NR | 830 | 2249 | NR | 960 | 749 | NR |
| 445 | 179997 | NR | 575 | 127511 | NR | 705 | 10757 | NR | 835 | 2573 | NR | 965 | 2669 | NR |
| 450 | 142822 | NR | 580 | 127577 | NR | 710 | 9601 | NR | 840 | 2764 | NR | 970 | 3968 | NR |
| 455 | 90008 | NR | 585 | 126153 | NR | 715 | 8944 | NR | 845 | 3109 | NR | 975 | 3886 | NR |
| 460 | 60557 | NR | 590 | 123678 | NR | 720 | 7947 | NR | 850 | 2963 | NR | 980 | 2788 | NR |
| 465 | 43305 | NR | 595 | 119774 | NR | 725 | 7062 | NR | 855 | 2336 | NR | 985 | 3496 | NR |
| 470 | 31089 | NR | 600 | 115733 | NR | 730 | 6004 | NR | 860 | 2118 | NR | 990 | 2913 | NR |
| 475 | 26278 | NR | 605 | 109231 | NR | 735 | 5594 | NR | 865 | 3144 | NR | 995 | 4659 | NR |
| 480 | 27060 | NR | 610 | 102408 | NR | 740 | 5165 | NR | 870 | 3069 | NR | 1000 | 1308 | NR |
| 485 | 30698 | NR | 615 | 96015 | NR | 745 | 4687 | NR | 875 | 3311 | NR | | | |

REPORT NUMBER: SP1-1908-441-4-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5 S/P: 1.77

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360 | 2945 | NR | 490 | 37941 | NR | 620 | 88803 | NR | 750 | 3908 | NR | 880 | 2997 | NR |
| 365 | 2596 | NR | 495 | 48525 | NR | 625 | 80578 | NR | 755 | 3988 | NR | 885 | 2927 | NR |
| 370 | 2732 | NR | 500 | 60609 | NR | 630 | 73127 | NR | 760 | 3335 | NR | 890 | 2649 | NR |
| 375 | 2894 | NR | 505 | 72036 | NR | 635 | 66244 | NR | 765 | 3438 | NR | 895 | 2828 | NR |
| 380 | 2822 | NR | 510 | 82168 | NR | 640 | 59440 | NR | 770 | 3427 | NR | 900 | 1407 | NR |
| 385 | 2394 | NR | 515 | 90898 | NR | 645 | 52864 | NR | 775 | 2759 | NR | 905 | 2224 | NR |
| 390 | 2370 | NR | 520 | 97142 | NR | 650 | 47085 | NR | 780 | 2340 | NR | 910 | 2905 | NR |
| 395 | 2267 | NR | 525 | 103255 | NR | 655 | 41789 | NR | 785 | 2412 | NR | 915 | 3350 | NR |
| 400 | 2262 | NR | 530 | 106697 | NR | 660 | 37064 | NR | 790 | 1999 | NR | 920 | 3114 | NR |
| 405 | 3000 | NR | 535 | 110081 | NR | 665 | 32299 | NR | 795 | 2054 | NR | 925 | 2834 | NR |
| 410 | 5324 | NR | 540 | 112494 | NR | 670 | 28142 | NR | 800 | 2331 | NR | 930 | 2271 | NR |
| 415 | 10725 | NR | 545 | 115513 | NR | 675 | 24505 | NR | 805 | 2648 | NR | 935 | 2228 | NR |
| 420 | 22128 | NR | 550 | 117203 | NR | 680 | 21162 | NR | 810 | 2485 | NR | 940 | 2833 | NR |
| 425 | 44095 | NR | 555 | 119753 | NR | 685 | 18400 | NR | 815 | 2409 | NR | 945 | 2941 | NR |
| 430 | 77002 | NR | 560 | 122602 | NR | 690 | 16065 | NR | 820 | 2221 | NR | 950 | 2323 | NR |
| 435 | 119881 | NR | 565 | 124314 | NR | 695 | 13860 | NR | 825 | 1562 | NR | 955 | 1667 | NR |
| 440 | 164454 | NR | 570 | 126775 | NR | 700 | 12177 | NR | 830 | 2249 | NR | 960 | 749 | NR |
| 445 | 179997 | NR | 575 | 127511 | NR | 705 | 10757 | NR | 835 | 2573 | NR | 965 | 2669 | NR |
| 450 | 142822 | NR | 580 | 127577 | NR | 710 | 9601 | NR | 840 | 2764 | NR | 970 | 3968 | NR |
| 455 | 90008 | NR | 585 | 126153 | NR | 715 | 8944 | NR | 845 | 3109 | NR | 975 | 3886 | NR |
| 460 | 60557 | NR | 590 | 123678 | NR | 720 | 7947 | NR | 850 | 2963 | NR | 980 | 2788 | NR |
| 465 | 43305 | NR | 595 | 119774 | NR | 725 | 7062 | NR | 855 | 2336 | NR | 985 | 3496 | NR |
| 470 | 31089 | NR | 600 | 115733 | NR | 730 | 6004 | NR | 860 | 2118 | NR | 990 | 2913 | NR |
| 475 | 26278 | NR | 605 | 109231 | NR | 735 | 5594 | NR | 865 | 3144 | NR | 995 | 4659 | NR |
| 480 | 27060 | NR | 610 | 102408 | NR | 740 | 5165 | NR | 870 | 3069 | NR | 1000 | 1308 | NR |
| 485 | 30698 | NR | 615 | 96015 | NR | 745 | 4687 | NR | 875 | 3311 | NR | | | |

REPORT NUMBER: SP1-1908-441-4-R4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 5378.9 M/P: 0.71

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360 | 2945 | NR | 490 | 37941 | NR | 620 | 88803 | NR | 750 | 3908 | NR | 880 | 2997 | NR |
| 365 | 2596 | NR | 495 | 48525 | NR | 625 | 80578 | NR | 755 | 3988 | NR | 885 | 2927 | NR |
| 370 | 2732 | NR | 500 | 60609 | NR | 630 | 73127 | NR | 760 | 3335 | NR | 890 | 2649 | NR |
| 375 | 2894 | NR | 505 | 72036 | NR | 635 | 66244 | NR | 765 | 3438 | NR | 895 | 2828 | NR |
| 380 | 2822 | NR | 510 | 82168 | NR | 640 | 59440 | NR | 770 | 3427 | NR | 900 | 1407 | NR |
| 385 | 2394 | NR | 515 | 90898 | NR | 645 | 52864 | NR | 775 | 2759 | NR | 905 | 2224 | NR |
| 390 | 2370 | NR | 520 | 97142 | NR | 650 | 47085 | NR | 780 | 2340 | NR | 910 | 2905 | NR |
| 395 | 2267 | NR | 525 | 103255 | NR | 655 | 41789 | NR | 785 | 2412 | NR | 915 | 3350 | NR |
| 400 | 2262 | NR | 530 | 106697 | NR | 660 | 37064 | NR | 790 | 1999 | NR | 920 | 3114 | NR |
| 405 | 3000 | NR | 535 | 110081 | NR | 665 | 32299 | NR | 795 | 2054 | NR | 925 | 2834 | NR |
| 410 | 5324 | NR | 540 | 112494 | NR | 670 | 28142 | NR | 800 | 2331 | NR | 930 | 2271 | NR |
| 415 | 10725 | NR | 545 | 115513 | NR | 675 | 24505 | NR | 805 | 2648 | NR | 935 | 2228 | NR |
| 420 | 22128 | NR | 550 | 117203 | NR | 680 | 21162 | NR | 810 | 2485 | NR | 940 | 2833 | NR |
| 425 | 44095 | NR | 555 | 119753 | NR | 685 | 18400 | NR | 815 | 2409 | NR | 945 | 2941 | NR |
| 430 | 77002 | NR | 560 | 122602 | NR | 690 | 16065 | NR | 820 | 2221 | NR | 950 | 2323 | NR |
| 435 | 119881 | NR | 565 | 124314 | NR | 695 | 13860 | NR | 825 | 1562 | NR | 955 | 1667 | NR |
| 440 | 164454 | NR | 570 | 126775 | NR | 700 | 12177 | NR | 830 | 2249 | NR | 960 | 749 | NR |
| 445 | 179997 | NR | 575 | 127511 | NR | 705 | 10757 | NR | 835 | 2573 | NR | 965 | 2669 | NR |
| 450 | 142822 | NR | 580 | 127577 | NR | 710 | 9601 | NR | 840 | 2764 | NR | 970 | 3968 | NR |
| 455 | 90008 | NR | 585 | 126153 | NR | 715 | 8944 | NR | 845 | 3109 | NR | 975 | 3886 | NR |
| 460 | 60557 | NR | 590 | 123678 | NR | 720 | 7947 | NR | 850 | 2963 | NR | 980 | 2788 | NR |
| 465 | 43305 | NR | 595 | 119774 | NR | 725 | 7062 | NR | 855 | 2336 | NR | 985 | 3496 | NR |
| 470 | 31089 | NR | 600 | 115733 | NR | 730 | 6004 | NR | 860 | 2118 | NR | 990 | 2913 | NR |
| 475 | 26278 | NR | 605 | 109231 | NR | 735 | 5594 | NR | 865 | 3144 | NR | 995 | 4659 | NR |
| 480 | 27060 | NR | 610 | 102408 | NR | 740 | 5165 | NR | 870 | 3069 | NR | 1000 | 1308 | NR |
| 485 | 30698 | NR | 615 | 96015 | NR | 745 | 4687 | NR | 875 | 3311 | NR | | | |

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TM-30-18

Summary

$R_f = 74.9$
 $R_g = 96.3$
 CIE $R_a = 73.5$
 $R_g = -28.4$



Color Vector Graphics



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

| | | | |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 | |



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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)