

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



Scaled data based on original data using
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-
State Lighting Products

Test Report Prepared for
Cooper Lighting Solutions
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P438656

Luminaire Tested: **IST-SA1E-727-U-SL3-HSS**

Issue Date: 12/10/2020

Test Information

Test Method: LM-79-08
Report Number: P438656
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-17)
Test Lab: INNOVATION CENTER
Issue Date: 12/10/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: McGRAW-EDISON
Catalog Number: IST-SA1E-727-U-SL3-HSS
Description: IMPACT ELITE LED TRAPEZOID LUMINAIRE
(1) 70 CRI, 2700K, 1050mA LIGHTSQUARE WITH 16 LEDS AND TYPE III SPILL
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD
Light Source: -
Ballast/Driver: ELECTRONIC DRIVER

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 4909 lumens
Efficiency: N/A
Efficacy: 84.3 lumens/watt
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')
IES Classification: Type III - Short
BUG Rating: B1 - U0 - G2

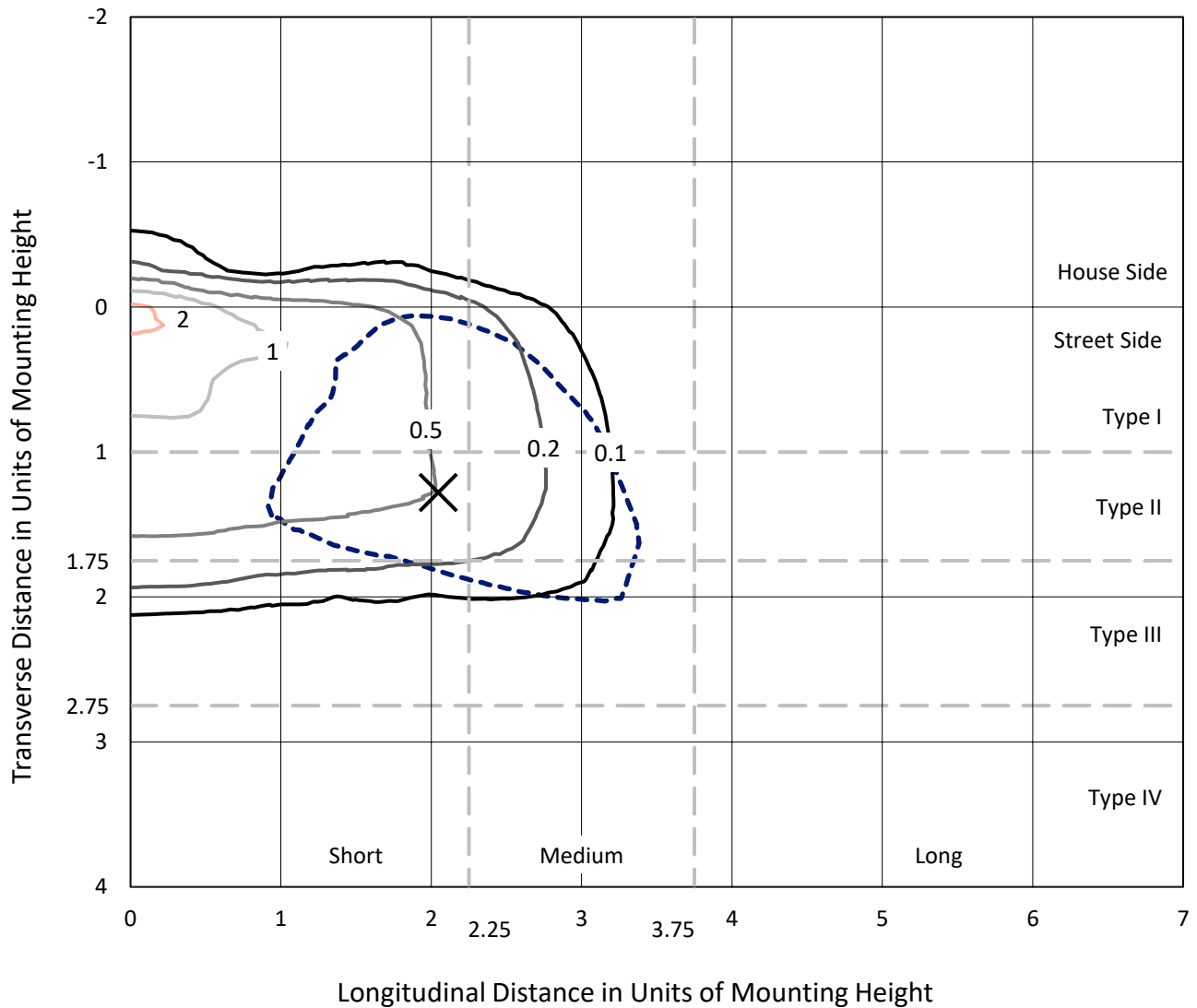
Input Watts (W): 58.2
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 28.75 FT



REPORT NUMBER: P438656
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Iso-Footcandle Lines of Horizontal Illumination

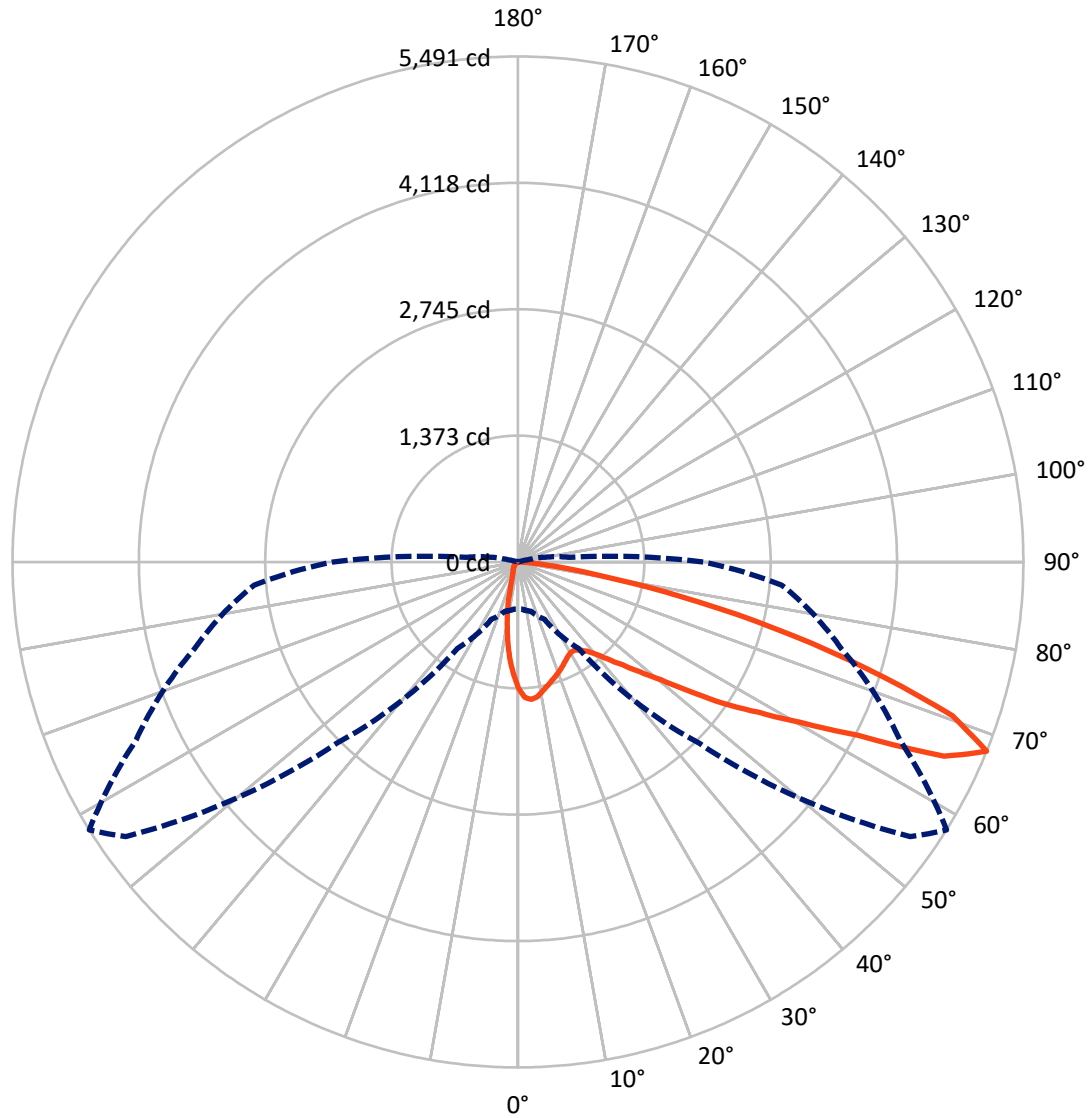
✕ Max cd
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 2.3 fc
 Type III - Short - N/A

REPORT NUMBER: P438656
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Luminous Intensity Polar Plot



— Vertical Plane Through 58-Deg Lateral - - - Horizontal Cone Through 67.5-Deg Vertical

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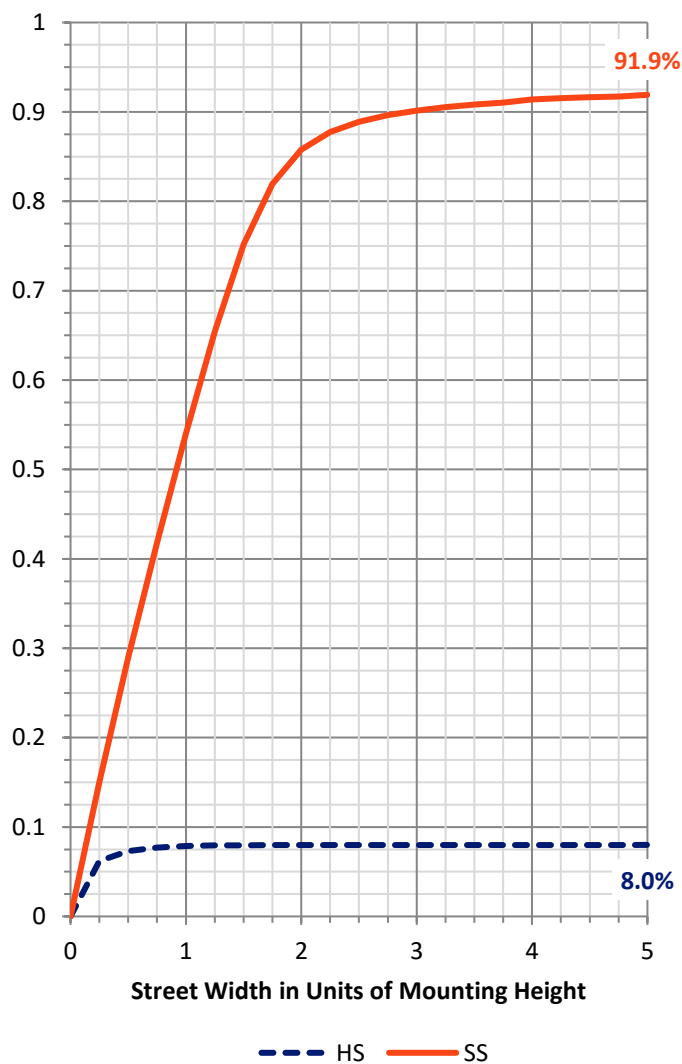
FLUX DISTRIBUTION:

| | | Downward | Upward | Total |
|--------------------|-----------|----------|--------|--------|
| House Side | Lumens | 395.8 | 0.0 | 395.8 |
| | % Fixture | 8.1 | 0.0 | 8.1 |
| Street Side | Lumens | 4513.2 | 0.0 | 4513.2 |
| | % Fixture | 91.9 | 0.0 | 91.9 |
| Total | Lumens | 4909.0 | 0.0 | 4909.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 110.7 | 2.3 |
| 10°-20° | 233.2 | 4.8 |
| 20°-30° | 315.6 | 6.4 |
| 30°-40° | 434.0 | 8.8 |
| 40°-50° | 679.4 | 13.8 |
| 50°-60° | 1144.6 | 23.3 |
| 60°-70° | 1358.3 | 27.7 |
| 70°-80° | 589.9 | 12.0 |
| 80°-90° | 43.3 | 0.9 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 4909.0 | 100.0 |
| 0°-180° | 4909.0 | 100.0 |

Coefficient of Utilization



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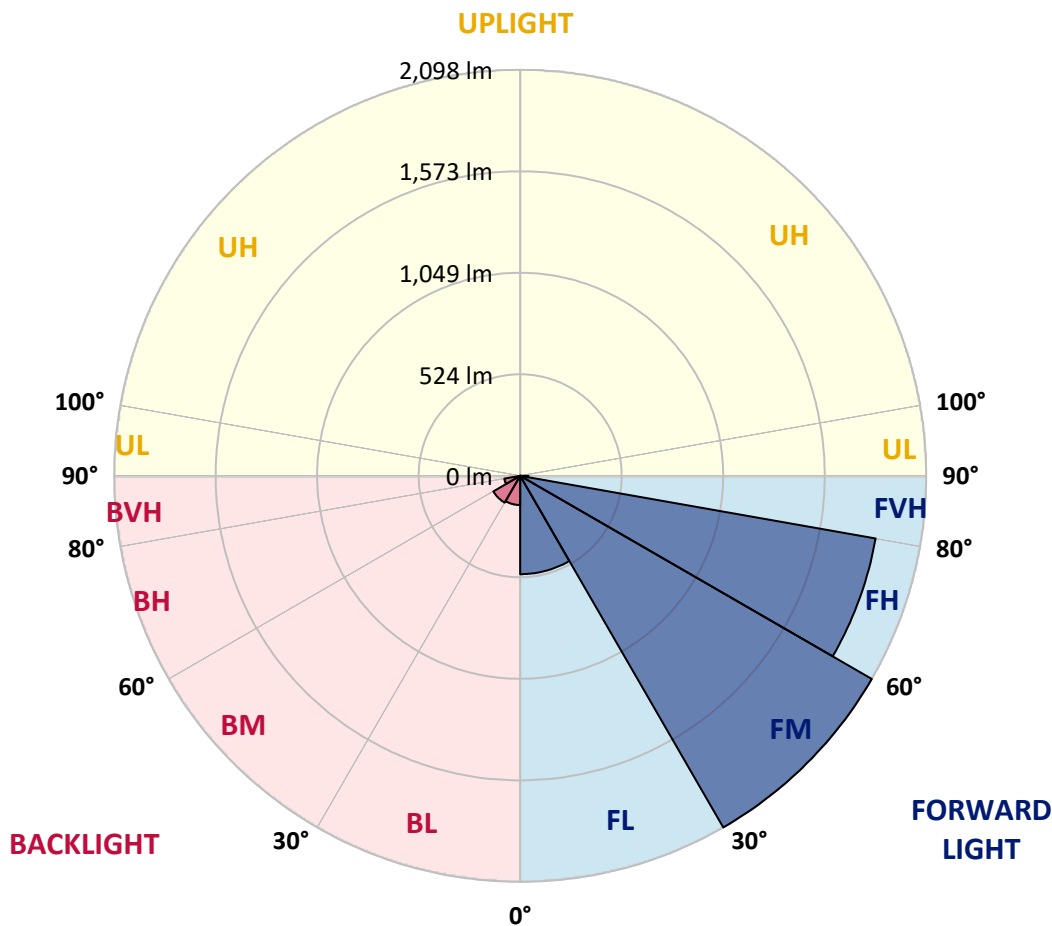
CATALOG NUMBER: IST-SA1E-727-U-SL3-HSS

LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | Lumens | % Fixture | Zone Rating/Lumen Limit | | |
|----------------|--------|-----------|-------------------------|------|---------|
| | | | B | U | G |
| FL (0°-30°) | 508.3 | 10.4 | | | |
| FM (30°-60°) | 2097.9 | 42.7 | | | |
| FH (60°-80°) | 1864.9 | 38.0 | | | G2/5000 |
| FVH (80°-90°) | 42.0 | 0.9 | | | G1/100 |
| BL (0°-30°) | 151.1 | 3.1 | B1/500 | | |
| BM (30°-60°) | 160.1 | 3.3 | B0/220 | | |
| BH (60°-80°) | 83.3 | 1.7 | B0/110 | | G0/110 |
| BVH (80°-90°) | 1.3 | 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-G2

Type III Short





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CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 58° | 65° | 75° | 85° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 |
| 2.5° | 1542.7 | 1534.3 | 1530.1 | 1527.9 | 1513.2 | 1500.5 | 1475.1 | 1473.0 | 1456.1 | 1424.4 | 1392.7 |
| 5° | 1508.9 | 1515.3 | 1517.4 | 1523.7 | 1521.6 | 1521.6 | 1504.7 | 1500.5 | 1477.2 | 1432.8 | 1371.6 |
| 7.5° | 1435.0 | 1432.8 | 1437.1 | 1454.0 | 1462.4 | 1479.3 | 1477.2 | 1481.5 | 1470.9 | 1422.3 | 1335.6 |
| 10° | 1327.2 | 1331.4 | 1344.1 | 1358.9 | 1382.1 | 1411.7 | 1430.7 | 1435.0 | 1443.4 | 1403.3 | 1301.8 |
| 12.5° | 1227.9 | 1234.2 | 1242.6 | 1272.2 | 1297.6 | 1344.1 | 1380.0 | 1388.5 | 1405.4 | 1384.2 | 1272.2 |
| 15° | 1145.4 | 1147.5 | 1153.9 | 1181.4 | 1223.6 | 1282.8 | 1335.6 | 1348.3 | 1375.8 | 1367.3 | 1249.0 |
| 17.5° | 1079.9 | 1082.0 | 1090.5 | 1113.7 | 1147.5 | 1217.3 | 1289.1 | 1310.3 | 1350.4 | 1356.8 | 1223.6 |
| 20° | 1044.0 | 1044.0 | 1044.0 | 1058.8 | 1092.6 | 1158.1 | 1242.6 | 1272.2 | 1329.3 | 1339.9 | 1202.5 |
| 22.5° | 1033.4 | 1033.4 | 1029.2 | 1033.4 | 1054.6 | 1109.5 | 1196.2 | 1232.1 | 1303.9 | 1333.5 | 1177.1 |
| 25° | 1048.2 | 1041.9 | 1041.9 | 1031.3 | 1033.4 | 1069.4 | 1153.9 | 1194.0 | 1289.1 | 1329.3 | 1164.5 |
| 27.5° | 1075.7 | 1073.6 | 1065.1 | 1056.7 | 1044.0 | 1052.4 | 1118.0 | 1158.1 | 1274.3 | 1335.6 | 1153.9 |
| 30° | 1107.4 | 1107.4 | 1103.2 | 1098.9 | 1077.8 | 1060.9 | 1101.1 | 1137.0 | 1268.0 | 1346.2 | 1147.5 |
| 32.5° | 1143.3 | 1141.2 | 1151.8 | 1156.0 | 1130.6 | 1098.9 | 1105.3 | 1139.1 | 1272.2 | 1377.9 | 1151.8 |
| 35° | 1185.6 | 1185.6 | 1204.6 | 1230.0 | 1208.8 | 1160.2 | 1145.4 | 1175.0 | 1293.4 | 1411.7 | 1168.7 |
| 37.5° | 1232.1 | 1234.2 | 1268.0 | 1303.9 | 1289.1 | 1246.9 | 1221.5 | 1232.1 | 1337.7 | 1475.1 | 1206.7 |
| 40° | 1287.0 | 1287.0 | 1337.7 | 1396.9 | 1396.9 | 1348.3 | 1314.5 | 1323.0 | 1401.1 | 1566.0 | 1274.3 |
| 42.5° | 1346.2 | 1352.5 | 1424.4 | 1496.2 | 1517.4 | 1473.0 | 1437.1 | 1447.6 | 1502.6 | 1684.3 | 1373.7 |
| 45° | 1430.7 | 1449.8 | 1542.7 | 1612.5 | 1654.7 | 1633.6 | 1587.1 | 1595.6 | 1635.7 | 1855.5 | 1523.7 |
| 47.5° | 1580.8 | 1597.7 | 1678.0 | 1747.7 | 1800.6 | 1811.1 | 1790.0 | 1785.8 | 1802.7 | 2056.3 | 1713.9 |
| 50° | 1760.4 | 1775.2 | 1830.2 | 1889.3 | 1963.3 | 2026.7 | 2014.0 | 2007.7 | 2014.0 | 2276.1 | 1946.4 |
| 52.5° | 1937.9 | 1931.6 | 1997.1 | 2028.8 | 2132.4 | 2271.8 | 2326.8 | 2326.8 | 2293.0 | 2506.4 | 2174.6 |
| 55° | 2096.4 | 2123.9 | 2193.6 | 2250.7 | 2337.4 | 2504.3 | 2690.3 | 2713.5 | 2597.3 | 2734.7 | 2364.8 |
| 57.5° | 2077.4 | 2104.9 | 2233.8 | 2413.4 | 2669.1 | 2895.3 | 3077.0 | 3081.3 | 2912.2 | 2910.1 | 2599.4 |
| 60° | 1855.5 | 1857.6 | 2030.9 | 2303.5 | 2815.0 | 3459.5 | 3565.2 | 3544.1 | 3186.9 | 3155.2 | 2922.8 |
| 62.5° | 1306.0 | 1297.6 | 1521.6 | 1868.2 | 2597.3 | 3768.1 | 4304.9 | 4144.3 | 3643.4 | 3539.8 | 3225.0 |
| 65° | 760.8 | 756.6 | 843.2 | 1115.8 | 1967.5 | 3550.4 | 5061.5 | 5086.8 | 4243.6 | 3736.4 | 3161.6 |
| 67.5° | 511.4 | 515.7 | 555.8 | 688.9 | 1147.5 | 2785.4 | 5200.9 | 5490.5 | 4577.5 | 3634.9 | 2876.3 |
| 70° | 376.2 | 376.2 | 407.9 | 507.2 | 680.5 | 1745.6 | 4543.7 | 5006.5 | 4643.0 | 3381.3 | 2407.1 |
| 72.5° | 268.4 | 268.4 | 312.8 | 410.0 | 555.8 | 900.3 | 3377.1 | 3968.9 | 3920.2 | 2806.5 | 1665.3 |
| 75° | 171.2 | 175.4 | 224.0 | 336.0 | 507.2 | 576.9 | 2290.9 | 2876.3 | 2734.7 | 1570.2 | 710.1 |
| 77.5° | 65.5 | 74.0 | 120.5 | 247.3 | 443.8 | 479.7 | 1306.0 | 1813.2 | 1443.4 | 549.5 | 190.2 |
| 80° | 23.2 | 23.2 | 40.2 | 126.8 | 312.8 | 395.2 | 682.6 | 900.3 | 469.2 | 133.1 | 71.9 |
| 82.5° | 4.2 | 4.2 | 14.8 | 52.8 | 154.3 | 274.7 | 397.3 | 443.8 | 183.9 | 44.4 | 42.3 |
| 85° | 0.0 | 0.0 | 2.1 | 10.6 | 35.9 | 27.5 | 158.5 | 150.0 | 57.1 | 19.0 | 27.5 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 2.1 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| 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: P438656
 CATALOG NUMBER: IST-SA1E-727-U-SL3-HSS

CANDELA DISTRIBUTION (continued):

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 | 1382.1 |
| 2.5° | 1367.3 | 1350.4 | 1301.8 | 1268.0 | 1221.5 | 1175.0 | 1145.4 | 1122.2 | 1111.6 | 1096.8 | 1103.2 |
| 5° | 1333.5 | 1295.5 | 1206.7 | 1126.4 | 1050.3 | 970.0 | 910.8 | 858.0 | 841.1 | 811.5 | 807.3 |
| 7.5° | 1282.8 | 1230.0 | 1098.9 | 972.1 | 849.6 | 748.1 | 657.2 | 587.5 | 524.1 | 496.6 | 513.5 |
| 10° | 1234.2 | 1162.3 | 991.2 | 822.1 | 659.4 | 517.8 | 410.0 | 325.5 | 276.8 | 255.7 | 259.9 |
| 12.5° | 1187.7 | 1096.8 | 879.1 | 678.4 | 479.7 | 319.1 | 232.5 | 188.1 | 173.3 | 171.2 | 167.0 |
| 15° | 1147.5 | 1035.5 | 779.8 | 526.2 | 319.1 | 200.8 | 164.8 | 154.3 | 152.2 | 152.2 | 152.2 |
| 17.5° | 1103.2 | 972.1 | 672.0 | 386.7 | 209.2 | 156.4 | 145.8 | 143.7 | 141.6 | 141.6 | 141.6 |
| 20° | 1069.4 | 917.2 | 572.7 | 270.5 | 160.6 | 139.5 | 135.3 | 135.3 | 133.1 | 133.1 | 133.1 |
| 22.5° | 1033.4 | 860.1 | 475.5 | 198.7 | 137.4 | 128.9 | 124.7 | 122.6 | 122.6 | 120.5 | 120.5 |
| 25° | 999.6 | 807.3 | 382.5 | 152.2 | 122.6 | 116.2 | 112.0 | 109.9 | 109.9 | 107.8 | 105.7 |
| 27.5° | 978.5 | 765.0 | 300.1 | 128.9 | 109.9 | 105.7 | 101.4 | 97.2 | 93.0 | 90.9 | 90.9 |
| 30° | 963.7 | 714.3 | 228.2 | 112.0 | 101.4 | 95.1 | 88.8 | 82.4 | 76.1 | 74.0 | 74.0 |
| 32.5° | 942.5 | 674.2 | 175.4 | 101.4 | 90.9 | 84.5 | 76.1 | 69.7 | 63.4 | 59.2 | 59.2 |
| 35° | 942.5 | 640.3 | 135.3 | 90.9 | 82.4 | 74.0 | 67.6 | 57.1 | 50.7 | 48.6 | 46.5 |
| 37.5° | 957.3 | 602.3 | 112.0 | 84.5 | 76.1 | 67.6 | 59.2 | 48.6 | 42.3 | 40.2 | 40.2 |
| 40° | 991.2 | 589.6 | 95.1 | 76.1 | 67.6 | 59.2 | 50.7 | 40.2 | 35.9 | 31.7 | 31.7 |
| 42.5° | 1060.9 | 593.8 | 84.5 | 71.9 | 61.3 | 52.8 | 42.3 | 33.8 | 29.6 | 27.5 | 27.5 |
| 45° | 1162.3 | 606.5 | 78.2 | 65.5 | 54.9 | 44.4 | 35.9 | 29.6 | 23.2 | 21.1 | 21.1 |
| 47.5° | 1303.9 | 646.7 | 69.7 | 59.2 | 48.6 | 38.0 | 29.6 | 23.2 | 19.0 | 16.9 | 16.9 |
| 50° | 1473.0 | 716.4 | 65.5 | 52.8 | 44.4 | 31.7 | 23.2 | 16.9 | 12.7 | 12.7 | 12.7 |
| 52.5° | 1671.7 | 786.2 | 59.2 | 48.6 | 38.0 | 27.5 | 19.0 | 12.7 | 10.6 | 8.5 | 8.5 |
| 55° | 1838.6 | 847.4 | 52.8 | 44.4 | 31.7 | 21.1 | 14.8 | 10.6 | 8.5 | 6.3 | 6.3 |
| 57.5° | 2056.3 | 936.2 | 44.4 | 38.0 | 25.4 | 16.9 | 10.6 | 8.5 | 4.2 | 4.2 | 4.2 |
| 60° | 2347.9 | 1041.9 | 38.0 | 31.7 | 19.0 | 12.7 | 8.5 | 4.2 | 4.2 | 2.1 | 2.1 |
| 62.5° | 2472.6 | 957.3 | 33.8 | 25.4 | 14.8 | 8.5 | 6.3 | 4.2 | 2.1 | 2.1 | 2.1 |
| 65° | 2335.2 | 781.9 | 27.5 | 19.0 | 10.6 | 6.3 | 4.2 | 2.1 | 2.1 | 0.0 | 0.0 |
| 67.5° | 2014.0 | 576.9 | 23.2 | 12.7 | 8.5 | 4.2 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 70° | 1642.1 | 426.9 | 16.9 | 8.5 | 4.2 | 4.2 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 72.5° | 1137.0 | 257.8 | 12.7 | 6.3 | 4.2 | 2.1 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 75° | 441.7 | 101.4 | 10.6 | 6.3 | 4.2 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 77.5° | 124.7 | 35.9 | 8.5 | 4.2 | 4.2 | 2.1 | 2.1 | 2.1 | 0.0 | 0.0 | 0.0 |
| 80° | 50.7 | 19.0 | 6.3 | 4.2 | 4.2 | 4.2 | 2.1 | 2.1 | 0.0 | 0.0 | 0.0 |
| 82.5° | 31.7 | 10.6 | 4.2 | 2.1 | 2.1 | 2.1 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 21.1 | 6.3 | 4.2 | 2.1 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 2.1 |
| 87.5° | 4.2 | 4.2 | 2.1 | 2.1 | 2.1 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-1-R4

Test Date: 08/20/2019

Luminaire Tested: SA1C-727-U-5WQ

Test Information

Test Method: LM-79-2008
 Report Number: SP1-1908-441-1-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-727-U-5WQ**
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

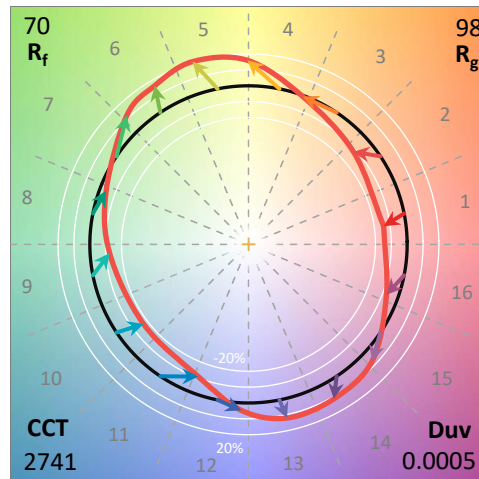
THIS IS A REVISION OF SP1-1908-441-1-R3. TO UPDATE THE CATALOG NUMBER.TESTED IN
 SITU. (1) 70 CRI, 2700K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

Spectral Parameters

CCT (K): 2741
 CIE u': 0.2605
 CIE v': 0.5272
 Duv: 0.0005
 CIE x: 0.4573
 CIE y: 0.4113
 CIE z: 0.1313
 Peak Wavelength (nm): 602
 Dominant Wavelength (nm): 583
 Purity: 61.2

| | | | |
|-----------|------|------|-------|
| CRI (Ra): | 71.5 | | |
| R1: | 69.2 | R9: | -16.1 |
| R2: | 79.4 | R10: | 51.4 |
| R3: | 87.8 | R11: | 63.1 |
| R4: | 69.4 | R12: | 42.0 |
| R5: | 66.4 | R13: | 70.2 |
| R6: | 69.8 | R14: | 92.4 |
| R7: | 79.8 | | |
| R8: | 50.1 | | |

Rf: 69.9
 Rg: 98.3



Test Conditions

Stabilization Time: 56M
 Operation Time: 12H
 Room Temperature (°C) / RH%: 25.3./42%
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-1-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 |

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CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-1-R4

Photopic Flux vs. Wavelength



Photopic Lumens: 6211.7

| 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 | 2044 | 0.0 | 490 | 7179 | 1.0 | 620 | 118034 | 30.7 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 1.9 | 625 | 111884 | 24.7 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 3.4 | 630 | 106119 | 19.2 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 6.3 | 635 | 99706 | 15.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 10.4 | 640 | 92142 | 11.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 16.3 | 645 | 84987 | 8.2 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 22.9 | 650 | 78016 | 5.7 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 29.7 | 655 | 71541 | 4.1 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 36.7 | 660 | 64863 | 2.7 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 42.5 | 665 | 58485 | 1.9 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.0 | 540 | 73435 | 47.8 | 670 | 51641 | 1.1 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.0 | 545 | 78677 | 52.4 | 675 | 46030 | 0.8 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 0.0 | 550 | 83331 | 56.6 | 680 | 40590 | 0.5 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 0.1 | 555 | 89120 | 60.9 | 685 | 35691 | 0.3 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 0.3 | 560 | 94613 | 64.3 | 690 | 31631 | 0.2 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 0.6 | 565 | 99818 | 66.4 | 695 | 27437 | 0.1 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 0.9 | 570 | 106526 | 69.3 | 700 | 24589 | 0.1 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 1.1 | 575 | 111610 | 69.4 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 1.0 | 580 | 117163 | 69.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 0.8 | 585 | 122201 | 67.9 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 0.6 | 590 | 125662 | 65.0 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 0.5 | 595 | 127415 | 60.4 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 0.4 | 600 | 129155 | 55.7 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 0.4 | 605 | 128057 | 49.6 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 0.5 | 610 | 126031 | 43.3 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 0.7 | 615 | 123059 | 37.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 6474.3 S/P: 1.04

| 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 | 2044 | 0.0 | 490 | 7179 | 6.0 | 620 | 118034 | 0.1 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 8.6 | 625 | 111884 | 0.1 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 12.5 | 630 | 106119 | 0.0 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 17.3 | 635 | 99706 | 0.0 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 21.8 | 640 | 92142 | 0.0 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 25.7 | 645 | 84987 | 0.0 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 27.5 | 650 | 78016 | 0.0 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 28.1 | 655 | 71541 | 0.0 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 27.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.0 | 535 | 68520 | 24.7 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.1 | 540 | 73435 | 21.5 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.5 | 545 | 78677 | 18.3 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 1.6 | 550 | 83331 | 15.0 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 3.9 | 555 | 89120 | 12.0 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 8.1 | 560 | 94613 | 9.3 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 13.3 | 565 | 99818 | 7.0 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 19.1 | 570 | 106526 | 5.2 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 21.6 | 575 | 111610 | 3.7 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 18.1 | 580 | 117163 | 2.6 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 11.8 | 585 | 122201 | 1.8 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 8.1 | 590 | 125662 | 1.2 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 6.2 | 595 | 127415 | 0.8 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 4.8 | 600 | 129155 | 0.5 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 4.1 | 605 | 128057 | 0.4 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 4.1 | 610 | 126031 | 0.2 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 4.6 | 615 | 123059 | 0.1 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

Melanopic Flux vs. Wavelength



Melanopic Lumens: 2145.7 M/P: 0.35

| 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 | 2044 | 0.0 | 490 | 7179 | 11.1 | 620 | 118034 | 1.5 | 750 | 8362 | 0.0 | 880 | 3128 | 0.0 |
| 365 | 2016 | 0.0 | 495 | 10476 | 16.9 | 625 | 111884 | 0.9 | 755 | 7635 | 0.0 | 885 | 3110 | 0.0 |
| 370 | 2020 | 0.0 | 500 | 15549 | 26.0 | 630 | 106119 | 0.6 | 760 | 6582 | 0.0 | 890 | 2632 | 0.0 |
| 375 | 2137 | 0.0 | 505 | 22477 | 38.2 | 635 | 99706 | 0.4 | 765 | 5777 | 0.0 | 895 | 2709 | 0.0 |
| 380 | 2046 | 0.0 | 510 | 30417 | 51.6 | 640 | 92142 | 0.2 | 770 | 5474 | 0.0 | 900 | 2016 | 0.0 |
| 385 | 1925 | 0.0 | 515 | 39274 | 65.1 | 645 | 84987 | 0.1 | 775 | 4977 | 0.0 | 905 | 1748 | 0.0 |
| 390 | 1893 | 0.0 | 520 | 47282 | 75.2 | 650 | 78016 | 0.1 | 780 | 4723 | 0.0 | 910 | 2046 | 0.0 |
| 395 | 1695 | 0.0 | 525 | 55413 | 82.9 | 655 | 71541 | 0.1 | 785 | 4219 | 0.0 | 915 | 1844 | 0.0 |
| 400 | 1633 | 0.0 | 530 | 62377 | 86.0 | 660 | 64863 | 0.0 | 790 | 3969 | 0.0 | 920 | 2734 | 0.0 |
| 405 | 2065 | 0.1 | 535 | 68520 | 85.4 | 665 | 58485 | 0.0 | 795 | 4122 | 0.0 | 925 | 2307 | 0.0 |
| 410 | 3449 | 0.2 | 540 | 73435 | 81.1 | 670 | 51641 | 0.0 | 800 | 2864 | 0.0 | 930 | 2039 | 0.0 |
| 415 | 7117 | 0.7 | 545 | 78677 | 75.4 | 675 | 46030 | 0.0 | 805 | 3151 | 0.0 | 935 | 1784 | 0.0 |
| 420 | 13992 | 2.3 | 550 | 83331 | 68.1 | 680 | 40590 | 0.0 | 810 | 3022 | 0.0 | 940 | 2464 | 0.0 |
| 425 | 25176 | 6.2 | 555 | 89120 | 60.9 | 685 | 35691 | 0.0 | 815 | 3471 | 0.0 | 945 | 2794 | 0.0 |
| 430 | 38151 | 13.0 | 560 | 94613 | 52.9 | 690 | 31631 | 0.0 | 820 | 2749 | 0.0 | 950 | 3090 | 0.0 |
| 435 | 49673 | 22.2 | 565 | 99818 | 44.8 | 695 | 27437 | 0.0 | 825 | 2729 | 0.0 | 955 | 1866 | 0.0 |
| 440 | 57273 | 32.0 | 570 | 106526 | 37.6 | 700 | 24589 | 0.0 | 830 | 2282 | 0.0 | 960 | 3110 | 0.0 |
| 445 | 54802 | 36.7 | 575 | 111610 | 30.4 | 705 | 21832 | 0.0 | 835 | 3140 | 0.0 | 965 | 3880 | 0.0 |
| 450 | 39184 | 30.4 | 580 | 117163 | 24.1 | 710 | 19500 | 0.0 | 840 | 2365 | 0.0 | 970 | 3243 | 0.0 |
| 455 | 22506 | 19.7 | 585 | 122201 | 18.7 | 715 | 17870 | 0.0 | 845 | 3024 | 0.0 | 975 | 2014 | 0.0 |
| 460 | 13692 | 13.2 | 590 | 125662 | 14.0 | 720 | 15924 | 0.0 | 850 | 2510 | 0.0 | 980 | 1688 | 0.0 |
| 465 | 9446 | 10.0 | 595 | 127415 | 10.2 | 725 | 14268 | 0.0 | 855 | 2739 | 0.0 | 985 | 2827 | 0.0 |
| 470 | 6698 | 7.7 | 600 | 129155 | 7.3 | 730 | 12438 | 0.0 | 860 | 3515 | 0.0 | 990 | 4172 | 0.0 |
| 475 | 5328 | 6.7 | 605 | 128057 | 5.0 | 735 | 11255 | 0.0 | 865 | 3600 | 0.0 | 995 | 3177 | 0.0 |
| 480 | 5081 | 6.9 | 610 | 126031 | 3.4 | 740 | 9951 | 0.0 | 870 | 3609 | 0.0 | 1000 | 3241 | 0.0 |
| 485 | 5579 | 8.1 | 615 | 123059 | 2.3 | 745 | 8870 | 0.0 | 875 | 3208 | 0.0 | | | |

REPORT NUMBER: SP1-1908-441-1-R4

TM-30-18

Summary

$R_f = 69.9$
 $R_g = 98.3$
 CIE $R_a = 71.5$
 $R_9 = -16.1$



Color Vector Graphics



REPORT NUMBER: SP1-1908-441-1-R4

TM-30-18

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

| | | | |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 54 | CES51 = 77 | CES76 = 48 |
| CES02 = 63 | CES27 = 74 | CES52 = 80 | CES77 = 75 |
| CES03 = 31 | CES28 = 80 | CES53 = 66 | CES78 = 56 |
| CES04 = 71 | CES29 = 44 | CES54 = 77 | CES79 = 81 |
| CES05 = 50 | CES30 = 46 | CES55 = 74 | CES80 = 80 |
| CES06 = 52 | CES31 = 50 | CES56 = 63 | CES81 = 73 |
| CES07 = 42 | CES32 = 49 | CES57 = 60 | CES82 = 91 |
| CES08 = 41 | CES33 = 53 | CES58 = 63 | CES83 = 84 |
| CES09 = 29 | CES34 = 66 | CES59 = 85 | CES84 = 90 |
| CES10 = 77 | CES35 = 82 | CES60 = 89 | CES85 = 87 |
| CES11 = 60 | CES36 = 78 | CES61 = 85 | CES86 = 65 |
| CES12 = 66 | CES37 = 75 | CES62 = 69 | CES87 = 78 |
| CES13 = 43 | CES38 = 53 | CES63 = 68 | CES88 = 73 |
| CES14 = 74 | CES39 = 91 | CES64 = 68 | CES89 = 68 |
| CES15 = 71 | CES40 = 85 | CES65 = 65 | CES90 = 68 |
| CES16 = 48 | CES41 = 76 | CES66 = 62 | CES91 = 91 |
| CES17 = 50 | CES42 = 76 | CES67 = 60 | CES92 = 71 |
| CES18 = 57 | CES43 = 65 | CES68 = 68 | CES93 = 82 |
| CES19 = 73 | CES44 = 98 | CES69 = 77 | CES94 = 57 |
| CES20 = 67 | CES45 = 75 | CES70 = 60 | CES95 = 78 |
| CES21 = 88 | CES46 = 70 | CES71 = 57 | CES96 = 80 |
| CES22 = 80 | CES47 = 63 | CES72 = 86 | CES97 = 79 |
| CES23 = 92 | CES48 = 51 | CES73 = 52 | CES98 = 71 |
| CES24 = 91 | CES49 = 68 | CES74 = 90 | CES99 = 64 |
| CES25 = 73 | CES50 = 77 | CES75 = 58 | |



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TM-30-18

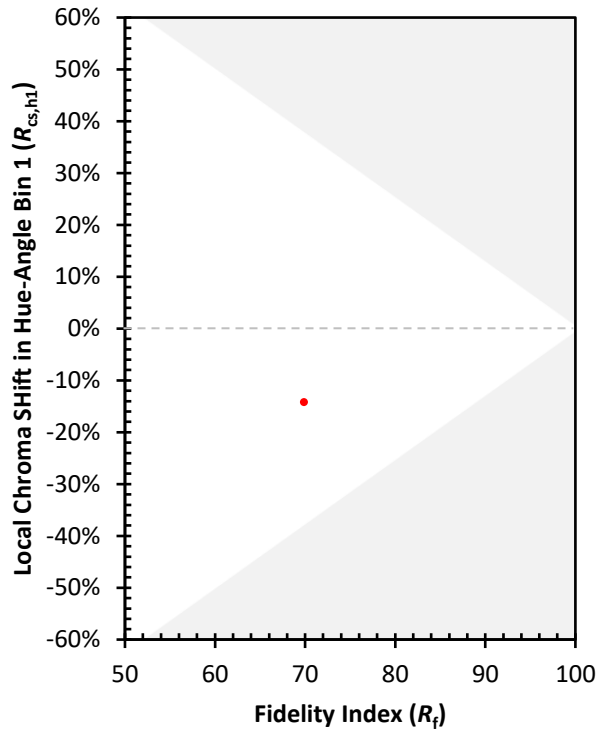
Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)