

Indoor Distribution Test Report

Spectrum Lighting Inc.

994 Jefferson Street
Fall River, MA 02721
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Spectrum Lighting Photometric Lab

Luminaire

SS4Mx TD10L E1 SDD4x 30K MW GL
Nom 4" square recessed downlight

Test Number

SP-00788_1

Test Date

The results contained in this report pertain only to this IES file.

Summary of Results

Power

| | |
|-------------|--------|
| Input Watts | 15.9 W |
|-------------|--------|

Lumen Output

| | |
|---------------|------------|
| Output Lumens | 714 |
| Efficacy | 44.88 lm/W |

Luminous Dimensions

| | |
|-----------------|------|
| 0° - 180° Size | 0.33 |
| 90° - 270° Size | 0.33 |
| Height | 0 |

Spacing Criterion

| | |
|---------------------------|------|
| Two luminaires, plane 0° | 1.07 |
| Two luminaires, plane 90° | 1.09 |
| Four luminaires | 1.12 |

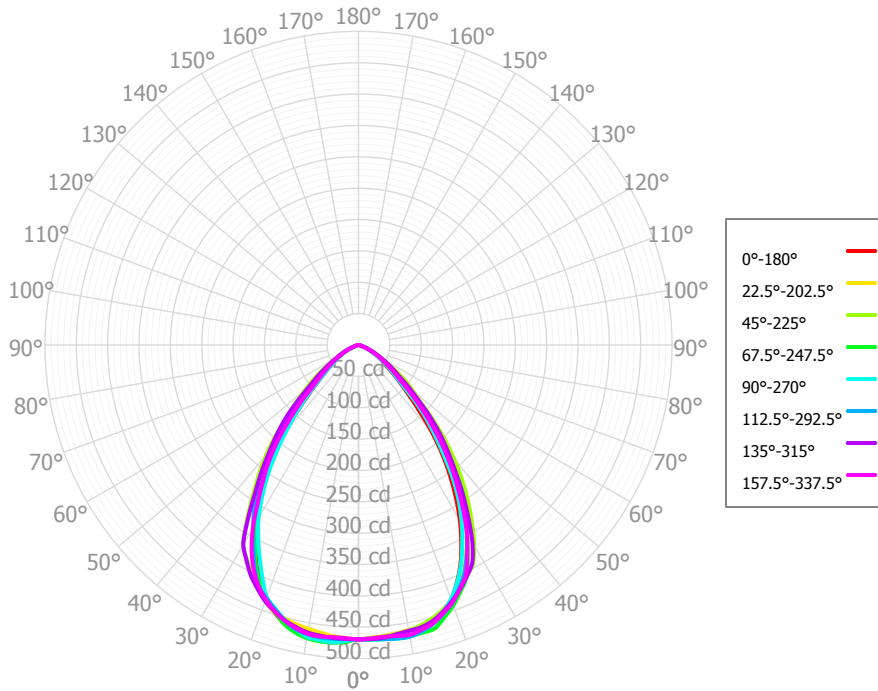
Full Beam Angle

| | |
|------------|-----|
| 0° - 180° | 72° |
| 90° - 270° | 73° |

IES File Header Contents

| Keyword | Value |
|-----------|---|
| TEST | SP-00788_1 |
| TESTLAB | Spectrum Lighting Photometric Lab, VLS-245-981 |
| MANUFAC | Spectrum Lighting |
| ISSUEDATE | 3/14/2019 |
| UPDATE | 4/23/2019 |
| LUMCAT | SS4Mx TD10L E1 SDD4x 30K MW GL |
| LUMINAIRE | Nom 4" square recessed downlight |
| OTHER | Beam Angle: 73 degrees |
| OTHER | Matte white trim; Clear glass lens |
| LAMPCAT | N/A |
| LAMP | N/A, White Light, CRI: 80 |
| OTHER | CCT Output Multipliers: N/A, only 3000K available |
| OTHER | Total luminaire wattages is approximate |
| OTHER | This report prepared by Spectrum Lighting |
| _CRI | 80 |
| _CCTMULT | only 30K available |
| _LAMPMULT | only 10L available |

Candela Polar Plot



Zonal Lumen Summary

| Zone | Lumens | % Fixture | Zone | Lumens | % Fixture |
|-----------------|--------|-----------|-------------------|--------|-----------|
| 0.00° - 10.00° | 45.41 | 6.36% | 90.00° - 100.00° | 0.10 | 0.01% |
| 10.00° - 20.00° | 128.15 | 17.96% | 100.00° - 110.00° | 0.00 | 0.00% |
| 20.00° - 30.00° | 180.28 | 25.26% | 100.00° - 120.00° | 0.00 | 0.00% |
| 30.00° - 40.00° | 170.77 | 23.93% | 120.00° - 130.00° | 0.00 | 0.00% |
| 40.00° - 50.00° | 109.19 | 15.30% | 130.00° - 140.00° | 0.00 | 0.00% |
| 50.00° - 60.00° | 52.83 | 7.40% | 140.00° - 150.00° | 0.00 | 0.00% |
| 60.00° - 70.00° | 21.56 | 3.02% | 150.00° - 160.00° | 0.00 | 0.00% |
| 70.00° - 80.00° | 4.01 | 0.56% | 160.00° - 170.00° | 0.00 | 0.00% |
| 80.00° - 90.00° | 1.27 | 0.18% | 170.00° - 180.00° | 0.00 | 0.00% |
| 0.00° - 90.00° | 713.46 | 99.99% | 0.00° - 180.00° | 713.55 | 100.00% |

Candela Distribution

| | 0.00° | 22.50° | 45.00° | 67.50° | 90.00° | 112.50° | 135.00° | 157.50° | 180.00° | 202.50° | 225.00° | 247.50° | 270.00° | 292.50° | 315.00° | 337.50° | 360.00° |
|---------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0.00° | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 | 469.54 |
| 2.50° | 468.24 | 467.24 | 468.31 | 470.54 | 470.19 | 469.76 | 469.13 | 468.00 | 468.70 | 467.73 | 470.74 | 474.15 | 472.50 | 469.30 | 469.58 | 468.25 | 468.24 |
| 5.00° | 466.37 | 465.86 | 466.60 | 470.52 | 470.88 | 470.29 | 468.88 | 467.71 | 466.92 | 466.17 | 470.69 | 476.30 | 475.88 | 471.13 | 468.47 | 467.10 | 466.37 |
| 7.50° | 464.56 | 463.85 | 465.03 | 470.98 | 472.49 | 470.53 | 467.57 | 468.94 | 464.99 | 462.81 | 469.03 | 476.44 | 474.53 | 472.00 | 465.32 | 468.09 | 464.56 |
| 10.00° | 462.78 | 461.56 | 462.24 | 471.55 | 472.36 | 468.32 | 465.83 | 467.91 | 463.06 | 459.54 | 466.64 | 474.72 | 472.59 | 472.05 | 462.82 | 469.57 | 462.78 |
| 12.50° | 461.11 | 459.61 | 458.03 | 470.07 | 467.29 | 464.56 | 460.77 | 462.50 | 460.98 | 456.38 | 460.74 | 469.29 | 463.28 | 467.76 | 461.17 | 465.04 | 461.11 |
| 15.00° | 457.18 | 457.78 | 451.80 | 468.28 | 459.75 | 454.92 | 454.63 | 455.13 | 458.41 | 451.92 | 453.64 | 460.16 | 453.52 | 460.50 | 455.81 | 459.57 | 457.18 |
| 17.50° | 446.51 | 450.12 | 443.68 | 455.53 | 446.84 | 442.19 | 445.20 | 444.73 | 446.66 | 446.24 | 442.09 | 444.95 | 441.26 | 449.77 | 446.63 | 448.80 | 446.51 |
| 20.00° | 432.31 | 440.90 | 433.16 | 441.87 | 431.14 | 429.41 | 434.99 | 431.99 | 433.74 | 434.30 | 429.35 | 428.76 | 428.35 | 437.14 | 435.27 | 437.50 | 432.31 |
| 22.50° | 410.04 | 420.79 | 420.74 | 425.33 | 410.47 | 416.59 | 420.77 | 416.25 | 409.96 | 417.58 | 415.94 | 411.29 | 400.77 | 419.58 | 422.10 | 421.54 | 410.04 |
| 25.00° | 385.04 | 398.62 | 407.91 | 408.39 | 386.69 | 391.69 | 405.91 | 395.37 | 385.21 | 394.64 | 402.40 | 387.49 | 373.25 | 399.82 | 407.79 | 405.20 | 385.04 |
| 27.50° | 355.12 | 372.26 | 394.81 | 377.34 | 358.46 | 363.00 | 386.98 | 369.16 | 354.99 | 367.77 | 385.42 | 356.94 | 346.40 | 373.85 | 392.70 | 375.61 | 355.12 |
| 30.00° | 323.47 | 345.36 | 369.08 | 346.59 | 329.26 | 335.99 | 367.63 | 336.71 | 323.94 | 335.64 | 368.02 | 327.62 | 318.65 | 345.73 | 363.32 | 345.66 | 323.47 |
| 32.50° | 289.22 | 312.72 | 336.99 | 319.39 | 298.95 | 309.38 | 327.70 | 299.04 | 289.60 | 300.86 | 331.28 | 299.39 | 285.51 | 317.11 | 326.01 | 310.20 | 289.22 |
| 35.00° | 254.54 | 279.70 | 304.29 | 290.93 | 264.52 | 273.32 | 287.02 | 265.84 | 255.03 | 269.81 | 293.29 | 266.86 | 251.64 | 288.35 | 289.45 | 274.93 | 254.54 |
| 37.50° | 219.32 | 244.55 | 271.35 | 253.19 | 226.15 | 235.71 | 253.27 | 235.76 | 219.77 | 240.23 | 261.23 | 231.24 | 214.70 | 250.78 | 253.21 | 241.17 | 219.32 |
| 40.00° | 182.98 | 209.36 | 237.00 | 216.95 | 191.91 | 203.86 | 219.85 | 201.79 | 183.94 | 205.90 | 229.11 | 198.91 | 178.93 | 211.57 | 221.74 | 207.35 | 182.98 |
| 42.50° | 145.55 | 173.49 | 202.22 | 187.84 | 160.84 | 172.57 | 191.53 | 165.65 | 146.79 | 170.08 | 194.56 | 168.46 | 146.84 | 181.46 | 191.94 | 173.18 | 145.55 |
| 45.00° | 115.67 | 138.31 | 167.15 | 157.25 | 129.13 | 138.77 | 162.80 | 132.62 | 114.34 | 136.89 | 160.80 | 134.90 | 116.92 | 152.40 | 160.18 | 140.22 | 115.67 |
| 47.50° | 91.91 | 110.03 | 132.02 | 121.61 | 97.02 | 105.01 | 130.75 | 100.95 | 90.48 | 104.28 | 134.96 | 99.88 | 92.14 | 119.52 | 127.91 | 111.71 | 91.91 |
| 50.00° | 73.84 | 83.89 | 112.32 | 91.09 | 76.98 | 86.03 | 100.97 | 81.76 | 71.52 | 84.66 | 109.97 | 79.11 | 71.51 | 86.43 | 103.65 | 86.66 | 73.84 |
| 52.50° | 59.47 | 70.53 | 95.11 | 74.36 | 63.11 | 67.50 | 82.73 | 66.96 | 59.73 | 67.01 | 90.03 | 63.53 | 58.89 | 72.15 | 80.85 | 71.24 | 59.47 |
| 55.00° | 49.10 | 57.69 | 74.86 | 59.32 | 51.86 | 55.64 | 65.43 | 55.25 | 49.18 | 56.16 | 70.67 | 52.60 | 47.80 | 58.18 | 66.97 | 57.40 | 49.10 |
| 57.50° | 40.81 | 47.06 | 54.33 | 47.79 | 41.67 | 44.21 | 51.63 | 44.34 | 40.13 | 45.95 | 53.67 | 42.93 | 39.06 | 48.07 | 54.17 | 47.00 | 40.81 |
| 60.00° | 32.84 | 37.23 | 42.67 | 37.71 | 33.01 | 36.30 | 39.36 | 35.08 | 32.13 | 35.37 | 38.64 | 35.29 | 30.79 | 38.25 | 43.09 | 37.52 | 32.84 |
| 62.50° | 25.01 | 29.86 | 31.36 | 30.00 | 24.80 | 28.57 | 31.38 | 26.12 | 25.16 | 24.89 | 29.78 | 28.06 | 23.12 | 31.03 | 32.10 | 29.68 | 25.01 |
| 65.00° | 19.22 | 22.97 | 23.55 | 22.83 | 18.99 | 21.78 | 23.58 | 20.55 | 19.06 | 19.50 | 21.21 | 21.48 | 16.97 | 23.88 | 22.59 | 22.80 | 19.22 |
| 67.50° | 14.09 | 17.17 | 16.01 | 16.34 | 13.72 | 15.35 | 16.14 | 15.39 | 13.62 | 14.22 | 13.30 | 14.99 | 12.36 | 17.09 | 13.61 | 17.23 | 14.09 |
| 70.00° | 9.09 | 11.79 | 10.45 | 11.01 | 9.45 | 9.96 | 9.93 | 9.94 | 8.76 | 9.61 | 7.62 | 9.39 | 7.90 | 10.99 | 9.21 | 11.29 | 9.09 |
| 72.50° | 4.56 | 6.91 | 5.88 | 6.54 | 5.56 | 5.54 | 5.06 | 5.14 | 4.16 | 5.66 | 4.54 | 4.72 | 3.53 | 6.31 | 5.53 | 5.06 | 4.56 |
| 75.00° | 2.30 | 3.97 | 2.90 | 3.40 | 2.83 | 2.05 | 2.87 | 1.95 | 2.52 | 2.76 | 2.73 | 2.50 | 1.92 | 3.49 | 3.06 | 2.78 | 2.30 |
| 77.50° | 1.40 | 2.11 | 1.81 | 1.50 | 1.78 | 1.54 | 1.68 | 1.18 | 1.56 | 1.84 | 1.64 | 1.47 | 1.25 | 1.91 | 2.05 | 1.73 | 1.40 |
| 80.00° | 1.24 | 1.50 | 1.39 | 1.22 | 1.53 | 1.51 | 1.25 | 1.39 | 1.31 | 1.34 | 1.46 | 1.20 | 1.50 | 1.68 | 1.41 | 1.76 | 1.24 |
| 82.50° | 1.08 | 1.38 | 1.34 | 1.34 | 1.30 | 1.40 | 1.35 | 1.50 | 1.33 | 1.09 | 1.25 | 1.39 | 1.18 | 1.37 | 1.12 | 1.34 | 1.08 |
| 85.00° | 1.21 | 1.41 | 1.20 | 0.89 | 1.09 | 1.04 | 1.22 | 0.69 | 1.34 | 1.12 | 1.36 | 1.16 | 1.16 | 1.49 | 1.45 | 1.42 | 1.21 |
| 87.50° | 1.00 | 0.99 | 1.03 | 0.96 | 1.14 | 1.03 | 1.11 | 1.21 | 0.86 | 1.18 | 1.20 | 1.15 | 1.09 | 1.15 | 1.14 | 1.26 | 1.00 |
| 90.00° | 0.94 | 0.37 | 0.73 | 0.44 | 1.17 | 0.80 | 0.48 | 0.57 | 0.34 | 0.88 | 0.37 | 0.52 | 1.25 | 0.65 | 1.11 | 0.50 | 0.94 |
| 92.50° | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95.00° | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 97.50° | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 100.00° | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 102.50° | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 105.00° | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 107.50° | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 110.00° | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 112.50° | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Coefficients of Utilization – Zonal Cavity Method

Values are lumens delivered to the workplane.

| | | | | | | | | | | | | | | | | | | |
|------------|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RCR | pfc | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 0% |
| | pcc | 80% | 80% | 80% | 80% | 70% | 70% | 70% | 70% | 50% | 50% | 50% | 30% | 30% | 30% | 10% | 10% | 0% |
| | pw | 70% | 50% | 30% | 10% | 70% | 50% | 30% | 10% | 50% | 30% | 10% | 50% | 30% | 10% | 50% | 30% | 30% |
| | 0 | 849 | 849 | 849 | 849 | 830 | 830 | 830 | 830 | 793 | 793 | 793 | 759 | 759 | 759 | 728 | 728 | 713 |
| | 1 | 801 | 777 | 756 | 737 | 783 | 761 | 742 | 725 | 732 | 716 | 702 | 705 | 693 | 681 | 680 | 670 | 657 |
| | 2 | 750 | 708 | 673 | 643 | 733 | 695 | 663 | 636 | 671 | 645 | 622 | 649 | 627 | 608 | 629 | 611 | 599 |
| | 3 | 701 | 645 | 602 | 568 | 686 | 635 | 595 | 563 | 615 | 582 | 554 | 597 | 569 | 545 | 580 | 557 | 545 |
| | 4 | 656 | 590 | 542 | 506 | 642 | 582 | 537 | 503 | 565 | 527 | 496 | 550 | 517 | 490 | 536 | 508 | 498 |
| | 5 | 614 | 542 | 492 | 454 | 601 | 535 | 487 | 452 | 521 | 480 | 448 | 508 | 472 | 444 | 496 | 465 | 456 |
| | 6 | 575 | 499 | 448 | 411 | 564 | 493 | 445 | 410 | 481 | 438 | 406 | 470 | 432 | 403 | 460 | 427 | 419 |
| | 7 | 540 | 461 | 410 | 374 | 529 | 456 | 408 | 373 | 446 | 403 | 371 | 437 | 398 | 369 | 428 | 393 | 386 |
| | 8 | 508 | 428 | 377 | 343 | 498 | 423 | 375 | 342 | 415 | 371 | 340 | 407 | 367 | 338 | 399 | 364 | 357 |
| | 9 | 479 | 398 | 349 | 315 | 470 | 394 | 347 | 315 | 387 | 344 | 313 | 380 | 340 | 312 | 373 | 337 | 332 |
| | 10 | 452 | 372 | 323 | 291 | 444 | 368 | 322 | 291 | 362 | 319 | 290 | 356 | 317 | 289 | 350 | 314 | 309 |

Cone of Light

| Mtg Height | Light Level | Beam Diameter |
|------------|-------------|---------------|
| 5.5 ft | 15.5 fc | 8.1 ft |
| 6.5 ft | 11.1 fc | 9.6 ft |
| 7.5 ft | 8.3 fc | 11.1 ft |
| 8.0 ft | 7.3 fc | 11.8 ft |
| 10.0 ft | 4.7 fc | 14.8 ft |
| 12.0 ft | 3.3 fc | 17.7 ft |
| 14.0 ft | 2.4 fc | 20.7 ft |
| 16.0 ft | 1.8 fc | 23.6 ft |
| 20.0 ft | 1.2 fc | 29.5 ft |
| 24.0 ft | 0.8 fc | 35.4 ft |
| 28.0 ft | 0.6 fc | 41.3 ft |

Average Luminaire Luminance [cd/m²]

| | 0.00° | 45.00° | 90.00° |
|---------------|--------|--------|--------|
| 0.00° | 46,411 | 46,411 | 46,411 |
| 45.00° | 16,169 | 23,365 | 18,050 |
| 55.00° | 8,461 | 12,900 | 8,938 |
| 65.00° | 4,496 | 5,507 | 4,442 |
| 75.00° | 880 | 1,109 | 1,079 |
| 85.00° | 1,370 | 1,360 | 1,235 |

UGR CIE 190:2010

| | | | | | | | | | | | |
|----------------------------|------------|-------------------------|------------|------------|------------|------------|-----------------------|------------|------------|------------|------------|
| Ceiling reflectance | | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 |
| Wall reflectance | | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 |
| Plane reflectance | | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Room dimensions | | Viewed crosswise | | | | | Viewed endwise | | | | |
| 2H | 2H | 16.7 | 18.0 | 17.1 | 18.3 | 18.6 | 16.3 | 17.5 | 16.7 | 17.9 | 18.2 |
| | 3H | 17.1 | 18.2 | 17.5 | 18.6 | 18.9 | 16.6 | 17.7 | 17.0 | 18.1 | 18.4 |
| | 4H | 17.1 | 18.1 | 17.5 | 18.5 | 18.8 | 16.6 | 17.6 | 17.0 | 18.0 | 18.3 |
| | 6H | 17.0 | 17.9 | 17.4 | 18.3 | 18.7 | 16.5 | 17.5 | 16.9 | 17.8 | 18.2 |
| | 8H | 17.0 | 17.9 | 17.4 | 18.2 | 18.6 | 16.5 | 17.4 | 16.9 | 17.8 | 18.2 |
| | 12H | 16.9 | 17.8 | 17.4 | 18.2 | 18.6 | 16.5 | 17.3 | 16.9 | 17.7 | 18.1 |
| 4H | 2H | 16.9 | 18.0 | 17.3 | 18.3 | 18.7 | 16.5 | 17.5 | 16.9 | 17.9 | 18.3 |
| | 3H | 17.4 | 18.2 | 17.8 | 18.6 | 19.0 | 16.9 | 17.7 | 17.3 | 18.1 | 18.5 |
| | 4H | 17.3 | 18.1 | 17.8 | 18.5 | 18.9 | 16.8 | 17.6 | 17.3 | 18.0 | 18.4 |
| | 6H | 17.3 | 17.9 | 17.7 | 18.3 | 18.8 | 16.8 | 17.4 | 17.2 | 17.9 | 18.3 |
| | 8H | 17.2 | 17.8 | 17.7 | 18.3 | 18.7 | 16.7 | 17.3 | 17.2 | 17.8 | 18.2 |
| | 12H | 17.2 | 17.7 | 17.7 | 18.2 | 18.7 | 16.7 | 17.2 | 17.2 | 17.7 | 18.2 |
| 8H | 4H | 17.2 | 17.8 | 17.7 | 18.3 | 18.7 | 16.7 | 17.3 | 17.2 | 17.8 | 18.2 |
| | 6H | 17.2 | 17.6 | 17.7 | 18.1 | 18.6 | 16.7 | 17.1 | 17.2 | 17.6 | 18.1 |
| | 8H | 17.1 | 17.5 | 17.6 | 18.1 | 18.5 | 16.6 | 17.0 | 17.1 | 17.6 | 18.1 |
| | 12H | 17.1 | 17.5 | 17.6 | 18.0 | 18.6 | 16.6 | 17.0 | 17.1 | 17.5 | 18.1 |
| 12H | 4H | 17.2 | 17.7 | 17.7 | 18.2 | 18.6 | 16.7 | 17.2 | 17.2 | 17.7 | 18.2 |
| | 6H | 17.1 | 17.5 | 17.6 | 18.0 | 18.5 | 16.6 | 17.0 | 17.1 | 17.5 | 18.0 |
| | 8H | 17.1 | 17.4 | 17.6 | 17.9 | 18.5 | 16.6 | 17.0 | 17.1 | 17.5 | 18.0 |

Corrected UGR values based on total output lumens

SHR = 1.0