

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: NEO-RAY

Report Number: P906810

Luminaire Tested: DFN2DIP-SQ4F0-100D060US835-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906810  
REPORT IS A COMBINATION OF REPORTS P900068 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-100D060US835-RLLFLL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

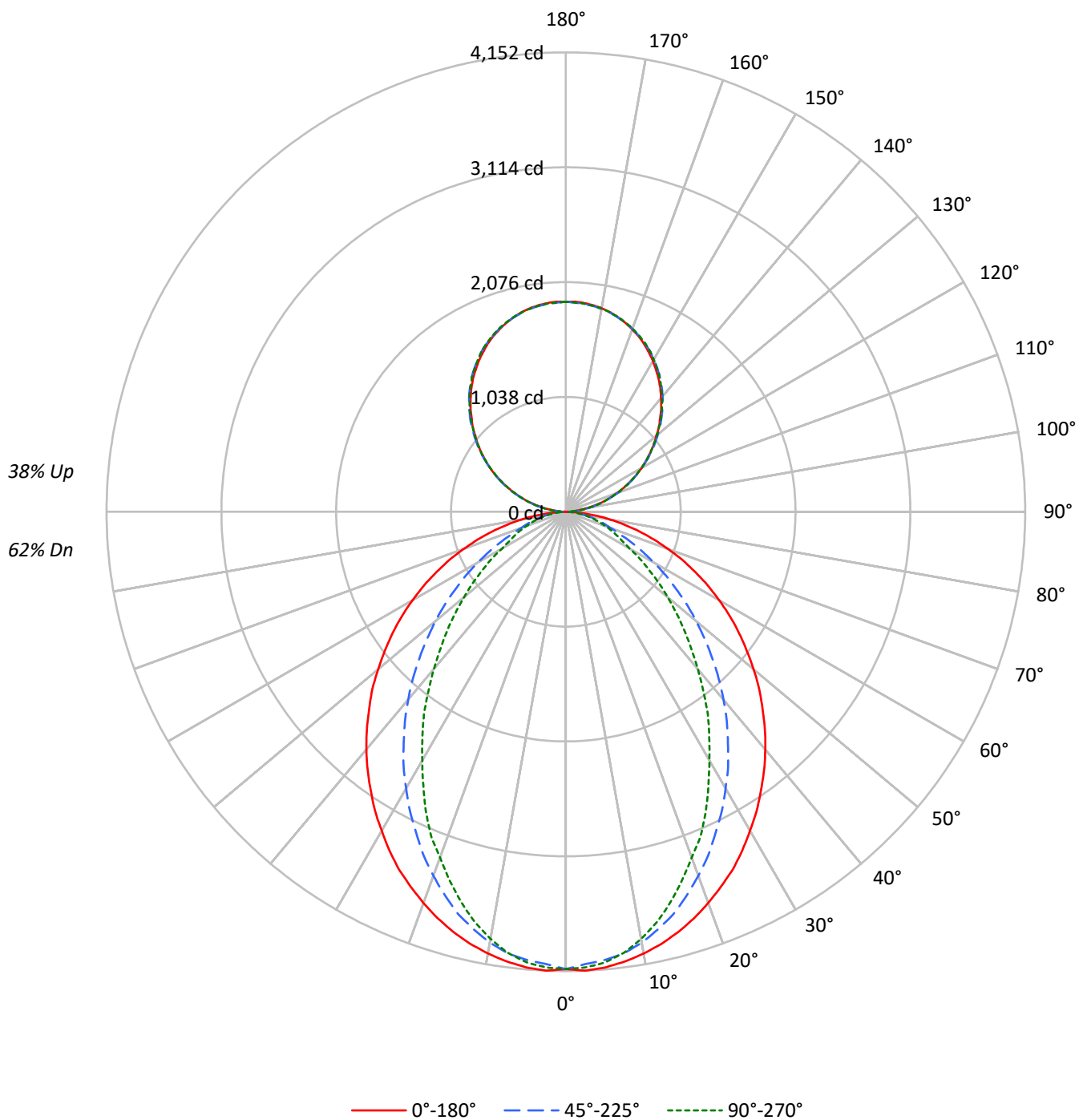
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13810.0 lumens  
Efficiency: N/A  
Efficacy: 100.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 137.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 78 | 78 | 78 | 67 | 67 | 67 |
| 1   | 101 | 97  | 93  | 90  | 94  | 91  | 88  | 85  | 80 | 77 | 75 | 69 | 68 | 66 | 60 | 59 | 58 |
| 2   | 92  | 85  | 79  | 74  | 86  | 80  | 75  | 70  | 71 | 67 | 63 | 62 | 59 | 56 | 53 | 51 | 49 |
| 3   | 85  | 75  | 68  | 63  | 79  | 71  | 65  | 60  | 63 | 58 | 54 | 55 | 51 | 48 | 48 | 45 | 43 |
| 4   | 78  | 67  | 60  | 54  | 73  | 63  | 57  | 51  | 56 | 51 | 46 | 49 | 45 | 42 | 43 | 40 | 37 |
| 5   | 72  | 60  | 52  | 46  | 67  | 57  | 50  | 44  | 51 | 45 | 41 | 45 | 40 | 37 | 39 | 36 | 33 |
| 6   | 66  | 54  | 46  | 41  | 62  | 51  | 44  | 39  | 46 | 40 | 36 | 41 | 36 | 32 | 36 | 32 | 29 |
| 7   | 62  | 49  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 37 | 33 | 29 | 33 | 29 | 26 |
| 8   | 57  | 45  | 37  | 32  | 54  | 43  | 36  | 31  | 38 | 33 | 28 | 34 | 30 | 26 | 30 | 27 | 24 |
| 9   | 53  | 41  | 34  | 29  | 50  | 39  | 32  | 28  | 35 | 30 | 26 | 32 | 27 | 24 | 28 | 24 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 30  | 25  | 33 | 27 | 23 | 29 | 25 | 22 | 26 | 22 | 20 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2900 | 2900 | 2900 |
| 5°  | 2905 | 2855 | 2873 |
| 10° | 2876 | 2799 | 2780 |
| 15° | 2836 | 2707 | 2637 |
| 20° | 2784 | 2580 | 2460 |
| 25° | 2730 | 2438 | 2289 |
| 30° | 2658 | 2292 | 2073 |
| 35° | 2587 | 2134 | 1882 |
| 40° | 2516 | 1972 | 1664 |
| 45° | 2432 | 1791 | 1466 |
| 50° | 2346 | 1609 | 1272 |
| 55° | 2256 | 1414 | 1086 |
| 60° | 2151 | 1210 | 895  |
| 65° | 2031 | 1003 | 806  |
| 70° | 1886 | 809  | 731  |
| 75° | 1703 | 715  | 667  |
| 80° | 1438 | 602  | 581  |
| 85° | 1002 | 405  | 442  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2432 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 387.3   | 2.8       |
| 10°-20°   | 1063.3  | 7.7       |
| 20°-30°   | 1492.9  | 10.8      |
| 30°-40°   | 1627.4  | 11.8      |
| 40°-50°   | 1495.7  | 10.8      |
| 50°-60°   | 1174.7  | 8.5       |
| 60°-70°   | 764.6   | 5.5       |
| 70°-80°   | 393.6   | 2.8       |
| 80°-90°   | 105.9   | 0.8       |
| 90°-100°  | 117.4   | 0.9       |
| 100°-110° | 373.1   | 2.7       |
| 110°-120° | 638.5   | 4.6       |
| 120°-130° | 839.7   | 6.1       |
| 130°-140° | 942.5   | 6.8       |
| 140°-150° | 924.2   | 6.7       |
| 150°-160° | 775.3   | 5.6       |
| 160°-170° | 514.2   | 3.7       |
| 170°-180° | 179.7   | 1.3       |
| 0°-30°    | 2943.6  | 21.3      |
| 0°-40°    | 4571.0  | 33.1      |
| 0°-60°    | 7241.3  | 52.4      |
| 0°-90°    | 8505.4  | 61.6      |
| 90°-120°  | 1129.0  | 8.2       |
| 90°-150°  | 3835.4  | 27.8      |
| 90°-180°  | 5305.0  | 38.4      |
| 0°-180°   | 13810.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4133 | 4133  | 4133 | 4133  | 4133 |      |
| 5°   | 4133 | 4114  | 4066 | 4099  | 4088 | 392  |
| 15°  | 3931 | 3890  | 3763 | 3692  | 3654 | 1108 |
| 25°  | 3568 | 3448  | 3202 | 3048  | 2992 | 1641 |
| 35°  | 3075 | 2884  | 2555 | 2319  | 2236 | 1924 |
| 45°  | 2514 | 2263  | 1870 | 1604  | 1515 | 1941 |
| 55°  | 1911 | 1620  | 1216 | 991   | 920  | 1708 |
| 65°  | 1290 | 987   | 651  | 524   | 512  | 1279 |
| 75°  | 688  | 426   | 299  | 273   | 269  | 728  |
| 85°  | 161  | 82    | 71   | 71    | 71   | 184  |
| 90°  | 2    | 21    | 56   | 53    | 54   | 14   |
| 95°  | 84   | 100   | 102  | 102   | 100  | 93   |
| 105° | 344  | 349   | 352  | 355   | 355  | 363  |
| 115° | 641  | 650   | 647  | 645   | 641  | 634  |
| 125° | 932  | 946   | 942  | 936   | 935  | 833  |
| 135° | 1205 | 1223  | 1226 | 1225  | 1220 | 932  |
| 145° | 1463 | 1475  | 1484 | 1486  | 1479 | 914  |
| 155° | 1673 | 1678  | 1683 | 1691  | 1686 | 770  |
| 165° | 1820 | 1819  | 1819 | 1830  | 1822 | 514  |
| 175° | 1894 | 1890  | 1886 | 1898  | 1888 | 180  |
| 180° | 1898 | 1898  | 1898 | 1898  | 1898 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4133.0 | 4133.0 | 4133.0 | 4133.0 | 4133.0 |
| 2.5°   | 4151.6 | 4133.0 | 4091.7 | 4129.4 | 4121.9 |
| 5°     | 4133.0 | 4114.3 | 4065.5 | 4099.3 | 4088.1 |
| 7.5°   | 4099.3 | 4077.0 | 4024.6 | 4039.3 | 4020.7 |
| 10°    | 4054.4 | 4028.2 | 3953.6 | 3942.1 | 3919.9 |
| 12.5°  | 3998.5 | 3964.7 | 3863.5 | 3841.3 | 3800.0 |
| 15°    | 3931.0 | 3889.7 | 3762.7 | 3691.7 | 3654.4 |
| 17.5°  | 3852.4 | 3792.5 | 3635.4 | 3553.2 | 3493.3 |
| 20°    | 3762.7 | 3687.7 | 3500.8 | 3407.6 | 3325.0 |
| 22.5°  | 3665.5 | 3579.4 | 3362.3 | 3235.4 | 3179.4 |
| 25°    | 3568.3 | 3448.5 | 3201.6 | 3048.4 | 2992.1 |
| 27.5°  | 3452.4 | 3325.0 | 3052.0 | 2876.2 | 2790.1 |
| 30°    | 3329.0 | 3186.5 | 2887.3 | 2696.9 | 2595.7 |
| 32.5°  | 3209.2 | 3036.9 | 2730.6 | 2506.0 | 2412.3 |
| 35°    | 3074.6 | 2883.8 | 2554.8 | 2319.1 | 2236.5 |
| 37.5°  | 2943.7 | 2737.7 | 2390.1 | 2131.8 | 2038.5 |
| 40°    | 2805.2 | 2581.0 | 2217.9 | 1952.4 | 1855.2 |
| 42.5°  | 2663.1 | 2423.8 | 2046.1 | 1769.1 | 1675.8 |
| 45°    | 2513.5 | 2262.7 | 1870.3 | 1604.4 | 1514.7 |
| 47.5°  | 2371.5 | 2106.0 | 1702.0 | 1436.1 | 1354.0 |
| 50°    | 2214.3 | 1948.8 | 1537.3 | 1279.0 | 1200.8 |
| 52.5°  | 2060.7 | 1780.2 | 1380.2 | 1133.3 | 1062.3 |
| 55°    | 1911.1 | 1619.5 | 1215.5 | 991.3  | 920.2  |
| 57.5°  | 1758.0 | 1458.7 | 1069.9 | 860.3  | 800.4  |
| 60°    | 1600.8 | 1301.6 | 916.3  | 725.8  | 665.9  |
| 62.5°  | 1447.6 | 1148.4 | 785.3  | 606.0  | 576.2  |
| 65°    | 1290.5 | 987.3  | 650.8  | 523.8  | 512.3  |
| 67.5°  | 1140.9 | 837.7  | 523.8  | 459.9  | 448.8  |
| 70°    | 983.7  | 692.1  | 433.7  | 396.4  | 381.4  |
| 72.5°  | 834.1  | 557.1  | 362.7  | 332.9  | 325.4  |
| 75°    | 688.1  | 426.2  | 299.2  | 273.0  | 269.4  |
| 77.5°  | 542.5  | 302.8  | 235.7  | 220.6  | 213.1  |
| 80°    | 407.5  | 217.1  | 179.4  | 164.7  | 164.7  |
| 82.5°  | 284.1  | 146.0  | 123.4  | 115.9  | 115.9  |
| 85°    | 160.7  | 82.1   | 71.0   | 71.0   | 71.0   |
| 87.5°  | 59.9   | 29.8   | 29.8   | 26.2   | 26.2   |
| 90°    | 1.7    | 20.6   | 56.1   | 52.6   | 54.3   |
| 92.5°  | 35.5   | 48.1   | 49.8   | 51.5   | 51.5   |
| 95°    | 83.5   | 99.5   | 102.4  | 102.4  | 99.5   |
| 97.5°  | 139.0  | 153.9  | 160.2  | 160.2  | 160.2  |
| 100°   | 203.1  | 216.2  | 220.8  | 220.8  | 219.1  |
| 102.5° | 270.6  | 280.3  | 286.6  | 288.3  | 286.6  |
| 105°   | 344.4  | 349.0  | 352.4  | 355.3  | 355.3  |
| 107.5° | 417.6  | 424.5  | 424.5  | 425.6  | 417.6  |
| 110°   | 488.6  | 497.7  | 497.7  | 497.7  | 493.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 565.2  | 574.9  | 573.2  | 568.6  | 565.2  |
| 115°   | 640.7  | 649.9  | 647.0  | 645.3  | 640.7  |
| 117.5° | 715.7  | 728.3  | 720.2  | 715.7  | 711.1  |
| 120°   | 791.2  | 803.8  | 791.2  | 791.2  | 786.0  |
| 122.5° | 859.8  | 875.8  | 867.8  | 863.3  | 859.8  |
| 125°   | 931.9  | 946.2  | 941.6  | 936.5  | 934.8  |
| 127.5° | 1002.3 | 1020.0 | 1013.7 | 1006.9 | 1002.3 |
| 130°   | 1068.1 | 1088.7 | 1085.8 | 1082.4 | 1076.1 |
| 132.5° | 1141.9 | 1157.9 | 1159.0 | 1151.0 | 1146.4 |
| 135°   | 1205.4 | 1223.1 | 1226.5 | 1224.8 | 1220.2 |
| 137.5° | 1276.3 | 1290.6 | 1293.5 | 1292.3 | 1285.5 |
| 140°   | 1338.7 | 1353.0 | 1361.0 | 1361.0 | 1354.7 |
| 142.5° | 1402.7 | 1417.0 | 1421.6 | 1423.3 | 1417.0 |
| 145°   | 1463.4 | 1474.8 | 1484.0 | 1485.7 | 1479.4 |
| 147.5° | 1517.7 | 1532.0 | 1538.9 | 1541.7 | 1535.4 |
| 150°   | 1573.8 | 1583.5 | 1589.8 | 1594.9 | 1589.8 |
| 152.5° | 1623.5 | 1633.3 | 1641.3 | 1647.6 | 1641.3 |
| 155°   | 1673.3 | 1677.9 | 1683.0 | 1691.1 | 1685.9 |
| 157.5° | 1716.2 | 1719.7 | 1722.5 | 1734.0 | 1726.0 |
| 160°   | 1754.6 | 1758.0 | 1759.7 | 1769.4 | 1762.6 |
| 162.5° | 1790.0 | 1790.0 | 1791.7 | 1802.6 | 1794.6 |
| 165°   | 1820.3 | 1818.6 | 1818.6 | 1830.1 | 1822.1 |
| 167.5° | 1847.8 | 1842.7 | 1842.7 | 1854.1 | 1846.1 |
| 170°   | 1868.4 | 1863.8 | 1862.1 | 1873.5 | 1863.8 |
| 172.5° | 1882.7 | 1878.1 | 1876.4 | 1887.8 | 1878.1 |
| 175°   | 1894.1 | 1889.6 | 1886.1 | 1897.6 | 1887.8 |
| 177.5° | 1900.4 | 1895.9 | 1892.4 | 1902.1 | 1892.4 |
| 180°   | 1897.6 | 1897.6 | 1897.6 | 1897.6 | 1897.6 |

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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 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 |       |       |       |       |
| X=2H            | Y=2H | 11.88            | 12.81 | 12.73 | 13.69 | 14.78 | 7.84           | 8.77  | 8.69  | 9.65  | 10.74 |
|                 | 3H   | 13.57            | 14.40 | 14.44 | 15.29 | 16.41 | 9.03           | 9.87  | 9.90  | 10.75 | 11.88 |
|                 | 4H   | 14.18            | 14.97 | 15.07 | 15.86 | 17.00 | 9.49           | 10.28 | 10.38 | 11.17 | 12.30 |
|                 | 6H   | 14.61            | 15.34 | 15.51 | 16.24 | 17.38 | 9.82           | 10.54 | 10.71 | 11.44 | 12.59 |
|                 | 8H   | 14.74            | 15.44 | 15.65 | 16.35 | 17.50 | 9.91           | 10.60 | 10.82 | 11.52 | 12.66 |
|                 | 12H  | 14.81            | 15.47 | 15.72 | 16.38 | 17.55 | 9.96           | 10.62 | 10.87 | 11.52 | 12.70 |
| 4H              | 2H   | 11.91            | 12.70 | 12.80 | 13.59 | 14.72 | 8.45           | 9.24  | 9.34  | 10.13 | 11.26 |
|                 | 3H   | 13.75            | 14.41 | 14.65 | 15.33 | 16.48 | 9.81           | 10.46 | 10.71 | 11.39 | 12.54 |
|                 | 4H   | 14.45            | 15.05 | 15.36 | 15.96 | 17.14 | 10.36          | 10.96 | 11.27 | 11.87 | 13.05 |
|                 | 6H   | 14.97            | 15.49 | 15.90 | 16.43 | 17.61 | 10.79          | 11.30 | 11.71 | 12.24 | 13.42 |
|                 | 8H   | 15.15            | 15.63 | 16.08 | 16.57 | 17.76 | 10.92          | 11.40 | 11.85 | 12.33 | 13.52 |
|                 | 12H  | 15.26            | 15.69 | 16.21 | 16.64 | 17.84 | 10.99          | 11.42 | 11.94 | 12.37 | 13.57 |
| 8H              | 4H   | 14.43            | 14.91 | 15.36 | 15.84 | 17.03 | 10.65          | 11.13 | 11.58 | 12.07 | 13.26 |
|                 | 6H   | 15.00            | 15.40 | 15.96 | 16.37 | 17.56 | 11.17          | 11.57 | 12.13 | 12.55 | 13.74 |
|                 | 8H   | 15.22            | 15.57 | 16.19 | 16.54 | 17.75 | 11.37          | 11.72 | 12.33 | 12.69 | 13.89 |
|                 | 12H  | 15.37            | 15.67 | 16.33 | 16.64 | 17.89 | 11.49          | 11.80 | 12.46 | 12.76 | 14.02 |
| 12H             | 4H   | 14.38            | 14.81 | 15.33 | 15.77 | 16.96 | 10.66          | 11.09 | 11.61 | 12.05 | 13.24 |
|                 | 6H   | 14.98            | 15.33 | 15.94 | 16.30 | 17.50 | 11.22          | 11.58 | 12.19 | 12.54 | 13.75 |
|                 | 8H   | 15.20            | 15.51 | 16.17 | 16.47 | 17.73 | 11.44          | 11.75 | 12.41 | 12.71 | 13.97 |