

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: P922418

Luminaire Tested: DFN2DIP-PN4F0-080D120US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922418  
REPORT IS A COMBINATION OF REPORTS P899762 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-080D120US940-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

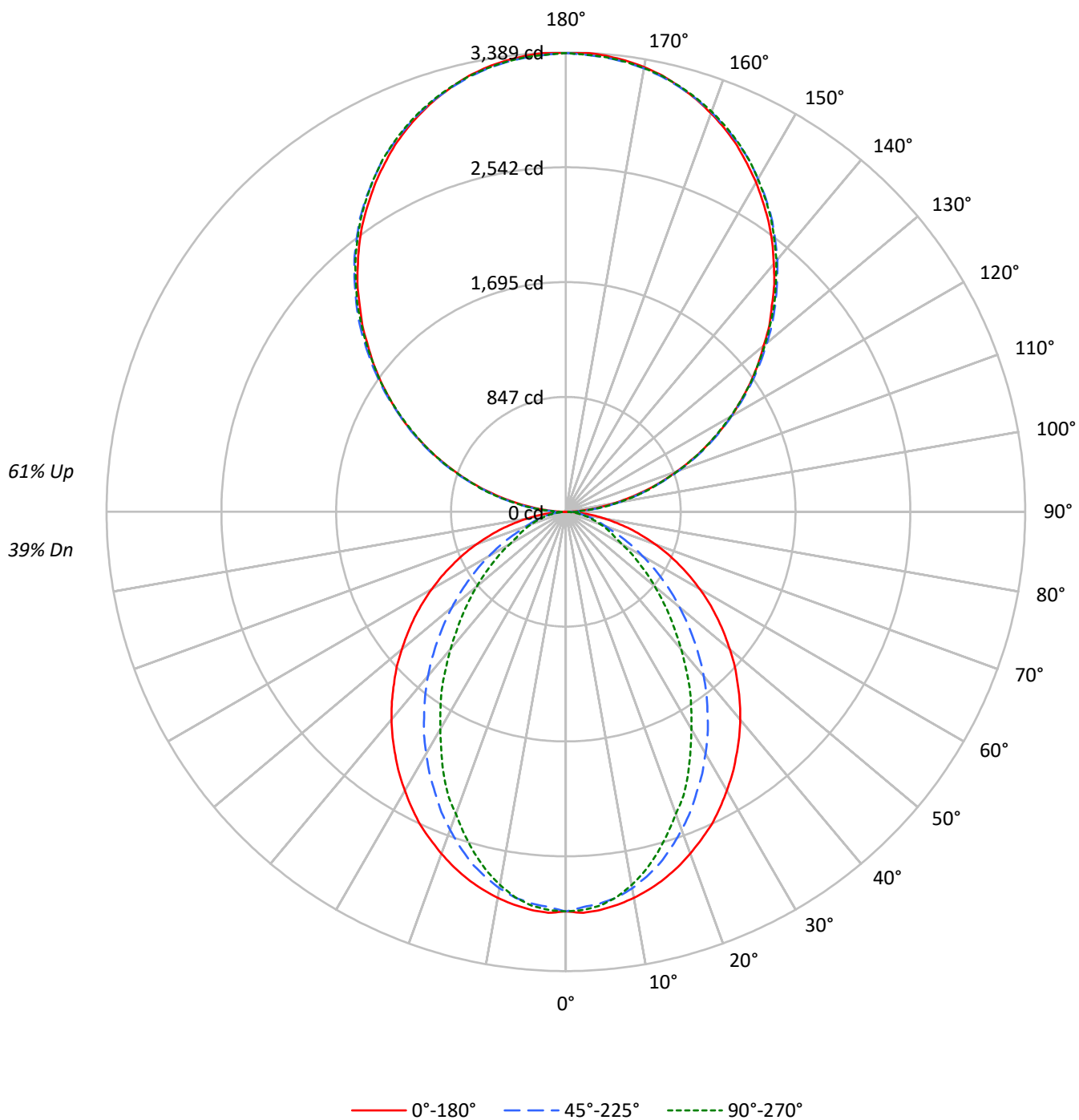
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15533.6 lumens  
Efficiency: N/A  
Efficacy: 86.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 180.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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



TEST NUMBER: P922418

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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   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 96  | 92  | 88  | 85  | 87 | 83 | 80 | 78 | 68 | 66 | 64 | 54 | 53 | 51 | 41 | 40 | 40 |
| 2   | 87  | 80  | 75  | 70  | 79 | 73 | 68 | 64 | 60 | 57 | 54 | 48 | 46 | 44 | 37 | 35 | 34 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 53 | 49 | 46 | 43 | 40 | 37 | 33 | 31 | 29 |
| 4   | 73  | 63  | 55  | 50  | 66 | 58 | 51 | 46 | 48 | 43 | 39 | 38 | 35 | 32 | 30 | 27 | 26 |
| 5   | 67  | 56  | 48  | 43  | 61 | 52 | 45 | 40 | 43 | 38 | 34 | 35 | 31 | 28 | 27 | 24 | 22 |
| 6   | 62  | 51  | 43  | 37  | 56 | 46 | 40 | 35 | 39 | 33 | 30 | 31 | 28 | 25 | 25 | 22 | 20 |
| 7   | 57  | 46  | 38  | 33  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 22 | 20 | 18 |
| 8   | 53  | 41  | 34  | 29  | 49 | 38 | 32 | 27 | 32 | 27 | 23 | 26 | 22 | 20 | 21 | 18 | 16 |
| 9   | 50  | 38  | 31  | 26  | 45 | 35 | 29 | 24 | 29 | 24 | 21 | 24 | 20 | 18 | 19 | 17 | 15 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 22 | 27 | 22 | 19 | 22 | 19 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2152 | 2152 | 2152 |
| 5°  | 2156 | 2118 | 2132 |
| 10° | 2134 | 2077 | 2063 |
| 15° | 2105 | 2009 | 1956 |
| 20° | 2066 | 1914 | 1825 |
| 25° | 2026 | 1808 | 1698 |
| 30° | 1973 | 1700 | 1537 |
| 35° | 1920 | 1583 | 1396 |
| 40° | 1867 | 1462 | 1233 |
| 45° | 1805 | 1328 | 1087 |
| 50° | 1741 | 1193 | 943  |
| 55° | 1674 | 1048 | 805  |
| 60° | 1597 | 897  | 663  |
| 65° | 1508 | 743  | 597  |
| 70° | 1400 | 600  | 541  |
| 75° | 1265 | 529  | 493  |
| 80° | 1068 | 445  | 429  |
| 85° | 745  | 298  | 325  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2649 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.3   | 1.8       |
| 10°-20°   | 758.6   | 4.9       |
| 20°-30°   | 1065.0  | 6.9       |
| 30°-40°   | 1160.9  | 7.5       |
| 40°-50°   | 1067.0  | 6.9       |
| 50°-60°   | 838.0   | 5.4       |
| 60°-70°   | 545.4   | 3.5       |
| 70°-80°   | 280.8   | 1.8       |
| 80°-90°   | 81.3    | 0.5       |
| 90°-100°  | 209.4   | 1.3       |
| 100°-110° | 665.4   | 4.3       |
| 110°-120° | 1138.7  | 7.3       |
| 120°-130° | 1497.5  | 9.6       |
| 130°-140° | 1680.9  | 10.8      |
| 140°-150° | 1648.3  | 10.6      |
| 150°-160° | 1382.7  | 8.9       |
| 160°-170° | 917.0   | 5.9       |
| 170°-180° | 320.5   | 2.1       |
| 0°-30°    | 2099.9  | 13.5      |
| 0°-40°    | 3260.8  | 21.0      |
| 0°-60°    | 5165.8  | 33.3      |
| 0°-90°    | 6073.3  | 39.1      |
| 90°-120°  | 2013.4  | 13.0      |
| 90°-150°  | 6840.1  | 44.0      |
| 90°-180°  | 9460.0  | 60.9      |
| 0°-180°   | 15533.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2948 | 2948  | 2948 | 2948  | 2948 |      |
| 5°   | 2948 | 2935  | 2900 | 2924  | 2916 | 280  |
| 15°  | 2804 | 2775  | 2684 | 2634  | 2607 | 790  |
| 25°  | 2546 | 2460  | 2284 | 2175  | 2134 | 1171 |
| 35°  | 2193 | 2057  | 1822 | 1654  | 1595 | 1373 |
| 45°  | 1793 | 1614  | 1334 | 1144  | 1081 | 1385 |
| 55°  | 1363 | 1155  | 867  | 707   | 656  | 1218 |
| 65°  | 921  | 704   | 464  | 374   | 365  | 913  |
| 75°  | 491  | 304   | 214  | 195   | 192  | 519  |
| 85°  | 115  | 59    | 51   | 51    | 51   | 132  |
| 90°  | 3    | 37    | 100  | 94    | 97   | 15   |
| 95°  | 149  | 178   | 183  | 183   | 178  | 166  |
| 105° | 614  | 622   | 628  | 634   | 634  | 648  |
| 115° | 1143 | 1159  | 1154 | 1151  | 1143 | 1130 |
| 125° | 1662 | 1688  | 1679 | 1670  | 1667 | 1485 |
| 135° | 2150 | 2181  | 2188 | 2184  | 2176 | 1662 |
| 145° | 2610 | 2630  | 2646 | 2650  | 2638 | 1631 |
| 155° | 2984 | 2992  | 3002 | 3016  | 3007 | 1374 |
| 165° | 3246 | 3243  | 3243 | 3264  | 3250 | 916  |
| 175° | 3378 | 3370  | 3364 | 3384  | 3367 | 321  |
| 180° | 3384 | 3384  | 3384 | 3384  | 3384 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2948.4 | 2948.4 | 2948.4 | 2948.4 | 2948.4 |
| 2.5°   | 2961.6 | 2948.4 | 2918.9 | 2945.8 | 2940.4 |
| 5°     | 2948.4 | 2935.1 | 2900.2 | 2924.3 | 2916.3 |
| 7.5°   | 2924.3 | 2908.4 | 2871.0 | 2881.6 | 2868.2 |
| 10°    | 2892.3 | 2873.6 | 2820.4 | 2812.2 | 2796.3 |
| 12.5°  | 2852.4 | 2828.3 | 2756.1 | 2740.2 | 2710.8 |
| 15°    | 2804.3 | 2774.8 | 2684.2 | 2633.6 | 2606.9 |
| 17.5°  | 2748.2 | 2705.4 | 2593.4 | 2534.8 | 2492.0 |
| 20°    | 2684.2 | 2630.7 | 2497.4 | 2430.9 | 2371.9 |
| 22.5°  | 2614.9 | 2553.4 | 2398.6 | 2308.0 | 2268.1 |
| 25°    | 2545.5 | 2460.1 | 2283.9 | 2174.7 | 2134.5 |
| 27.5°  | 2462.8 | 2371.9 | 2177.2 | 2051.8 | 1990.4 |
| 30°    | 2374.8 | 2273.1 | 2059.8 | 1923.9 | 1851.6 |
| 32.5°  | 2289.3 | 2166.5 | 1947.9 | 1787.7 | 1720.9 |
| 35°    | 2193.3 | 2057.2 | 1822.5 | 1654.4 | 1595.4 |
| 37.5°  | 2099.9 | 1953.0 | 1705.0 | 1520.7 | 1454.2 |
| 40°    | 2001.2 | 1841.2 | 1582.2 | 1392.8 | 1323.4 |
| 42.5°  | 1899.8 | 1729.1 | 1459.6 | 1262.0 | 1195.4 |
| 45°    | 1793.1 | 1614.2 | 1334.2 | 1144.5 | 1080.6 |
| 47.5°  | 1691.8 | 1502.4 | 1214.2 | 1024.5 | 965.9  |
| 50°    | 1579.6 | 1390.3 | 1096.7 | 912.4  | 856.6  |
| 52.5°  | 1470.1 | 1269.9 | 984.5  | 808.5  | 757.9  |
| 55°    | 1363.3 | 1155.3 | 867.1  | 707.1  | 656.5  |
| 57.5°  | 1254.1 | 1040.6 | 763.2  | 613.8  | 571.0  |
| 60°    | 1141.9 | 928.5  | 653.6  | 517.7  | 475.0  |
| 62.5°  | 1032.7 | 819.2  | 560.3  | 432.3  | 411.1  |
| 65°    | 920.6  | 704.3  | 464.2  | 373.7  | 365.4  |
| 67.5°  | 813.9  | 597.6  | 373.7  | 328.1  | 320.2  |
| 70°    | 701.8  | 493.7  | 309.4  | 282.8  | 272.1  |
| 72.5°  | 595.0  | 397.4  | 258.8  | 237.6  | 232.1  |
| 75°    | 490.9  | 304.1  | 213.5  | 194.7  | 192.3  |
| 77.5°  | 387.0  | 216.0  | 168.2  | 157.4  | 152.0  |
| 80°    | 290.7  | 154.9  | 128.0  | 117.4  | 117.4  |
| 82.5°  | 202.7  | 104.2  | 88.0   | 82.7   | 82.7   |
| 85°    | 114.7  | 58.6   | 50.6   | 50.6   | 50.6   |
| 87.5°  | 42.7   | 21.2   | 21.2   | 18.7   | 18.7   |
| 90°    | 3.0    | 36.7   | 100.0  | 93.9   | 96.9   |
| 92.5°  | 63.2   | 85.7   | 88.7   | 91.8   | 91.8   |
| 95°    | 148.9  | 177.5  | 182.6  | 182.6  | 177.5  |
| 97.5°  | 247.9  | 274.5  | 285.7  | 285.7  | 285.7  |
| 100°   | 362.2  | 385.7  | 393.8  | 393.8  | 390.7  |
| 102.5° | 482.6  | 499.9  | 511.1  | 514.2  | 511.1  |
| 105°   | 614.2  | 622.3  | 628.5  | 633.6  | 633.6  |
| 107.5° | 744.8  | 757.1  | 757.1  | 759.0  | 744.8  |
| 110°   | 871.3  | 887.6  | 887.6  | 887.6  | 879.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1008.0 | 1025.4 | 1022.3 | 1014.1 | 1008.0 |
| 115°   | 1142.6 | 1159.0 | 1153.9 | 1150.8 | 1142.6 |
| 117.5° | 1276.3 | 1298.8 | 1284.5 | 1276.3 | 1268.2 |
| 120°   | 1411.0 | 1433.4 | 1411.0 | 1411.0 | 1401.9 |
| 122.5° | 1533.5 | 1562.0 | 1547.7 | 1539.5 | 1533.5 |
| 125°   | 1662.0 | 1687.5 | 1679.4 | 1670.2 | 1667.1 |
| 127.5° | 1787.5 | 1819.1 | 1807.9 | 1795.6 | 1787.5 |
| 130°   | 1904.8 | 1941.5 | 1936.4 | 1930.3 | 1919.0 |
| 132.5° | 2036.4 | 2065.0 | 2067.0 | 2052.7 | 2044.6 |
| 135°   | 2149.6 | 2181.3 | 2187.5 | 2184.3 | 2176.2 |
| 137.5° | 2276.2 | 2301.7 | 2306.8 | 2304.7 | 2292.5 |
| 140°   | 2387.4 | 2412.9 | 2427.1 | 2427.1 | 2415.9 |
| 142.5° | 2501.7 | 2527.2 | 2535.3 | 2538.3 | 2527.2 |
| 145°   | 2609.8 | 2630.2 | 2646.5 | 2649.6 | 2638.4 |
| 147.5° | 2706.7 | 2732.2 | 2744.5 | 2749.6 | 2738.4 |
| 150°   | 2806.7 | 2824.0 | 2835.3 | 2844.5 | 2835.3 |
| 152.5° | 2895.5 | 2912.8 | 2927.1 | 2938.4 | 2927.1 |
| 155°   | 2984.2 | 2992.4 | 3001.6 | 3015.9 | 3006.7 |
| 157.5° | 3060.8 | 3066.9 | 3071.9 | 3092.4 | 3078.1 |
| 160°   | 3129.1 | 3135.3 | 3138.3 | 3155.7 | 3143.4 |
| 162.5° | 3192.3 | 3192.3 | 3195.4 | 3214.8 | 3200.5 |
| 165°   | 3246.4 | 3243.4 | 3243.4 | 3263.7 | 3249.5 |
| 167.5° | 3295.4 | 3286.2 | 3286.2 | 3306.6 | 3292.4 |
| 170°   | 3332.1 | 3323.9 | 3320.9 | 3341.3 | 3323.9 |
| 172.5° | 3357.6 | 3349.4 | 3346.4 | 3366.8 | 3349.4 |
| 175°   | 3378.1 | 3369.9 | 3363.8 | 3384.1 | 3366.8 |
| 177.5° | 3389.3 | 3381.1 | 3374.9 | 3392.3 | 3374.9 |
| 180°   | 3384.1 | 3384.1 | 3384.1 | 3384.1 | 3384.1 |

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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 | 8.70             | 9.45  | 9.76  | 10.50 | 11.93 | 4.67           | 5.42 | 5.72 | 6.47 | 7.89  |
|                 | 3H   | 10.38            | 11.05 | 11.44 | 12.11 | 13.55 | 5.85           | 6.52 | 6.91 | 7.58 | 9.02  |
|                 | 4H   | 10.98            | 11.62 | 12.06 | 12.68 | 14.13 | 6.30           | 6.93 | 7.37 | 8.00 | 9.44  |
|                 | 6H   | 11.40            | 11.99 | 12.49 | 13.05 | 14.51 | 6.62           | 7.20 | 7.70 | 8.27 | 9.73  |
|                 | 8H   | 11.53            | 12.08 | 12.62 | 13.17 | 14.62 | 6.71           | 7.26 | 7.79 | 8.34 | 9.80  |
|                 | 12H  | 11.59            | 12.12 | 12.68 | 13.19 | 14.67 | 6.75           | 7.27 | 7.84 | 8.35 | 9.83  |
| 4H              | 2H   | 8.71             | 9.35  | 9.79  | 10.41 | 11.86 | 5.26           | 5.89 | 6.34 | 6.95 | 8.40  |
|                 | 3H   | 10.54            | 11.06 | 11.62 | 12.15 | 13.61 | 6.60           | 7.13 | 7.69 | 8.22 | 9.68  |
|                 | 4H   | 11.23            | 11.71 | 12.32 | 12.79 | 14.27 | 7.15           | 7.63 | 8.24 | 8.71 | 10.19 |
|                 | 6H   | 11.74            | 12.16 | 12.84 | 13.26 | 14.73 | 7.56           | 7.98 | 8.66 | 9.08 | 10.55 |
|                 | 8H   | 11.92            | 12.30 | 13.02 | 13.40 | 14.89 | 7.69           | 8.08 | 8.79 | 9.17 | 10.66 |
|                 | 12H  | 12.01            | 12.36 | 13.13 | 13.47 | 14.96 | 7.75           | 8.10 | 8.87 | 9.21 | 10.70 |
| 8H              | 4H   | 11.19            | 11.58 | 12.29 | 12.67 | 14.16 | 7.42           | 7.81 | 8.52 | 8.90 | 10.39 |
|                 | 6H   | 11.76            | 12.08 | 12.88 | 13.21 | 14.70 | 7.94           | 8.26 | 9.06 | 9.39 | 10.88 |
|                 | 8H   | 11.97            | 12.25 | 13.10 | 13.37 | 14.88 | 8.13           | 8.41 | 9.26 | 9.53 | 11.03 |
|                 | 12H  | 12.11            | 12.36 | 13.24 | 13.47 | 15.02 | 8.25           | 8.49 | 9.38 | 9.61 | 11.15 |
| 12H             | 4H   | 11.14            | 11.49 | 12.25 | 12.60 | 14.09 | 7.42           | 7.77 | 8.54 | 8.88 | 10.38 |
|                 | 6H   | 11.73            | 12.01 | 12.86 | 13.13 | 14.64 | 7.99           | 8.27 | 9.11 | 9.39 | 10.89 |
|                 | 8H   | 11.95            | 12.20 | 13.08 | 13.31 | 14.86 | 8.20           | 8.44 | 9.33 | 9.56 | 11.10 |