

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: P911432

Luminaire Tested: DFN2DIP-PN4F0-060D120US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911432  
REPORT IS A COMBINATION OF REPORTS P899757 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-060D120US850-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

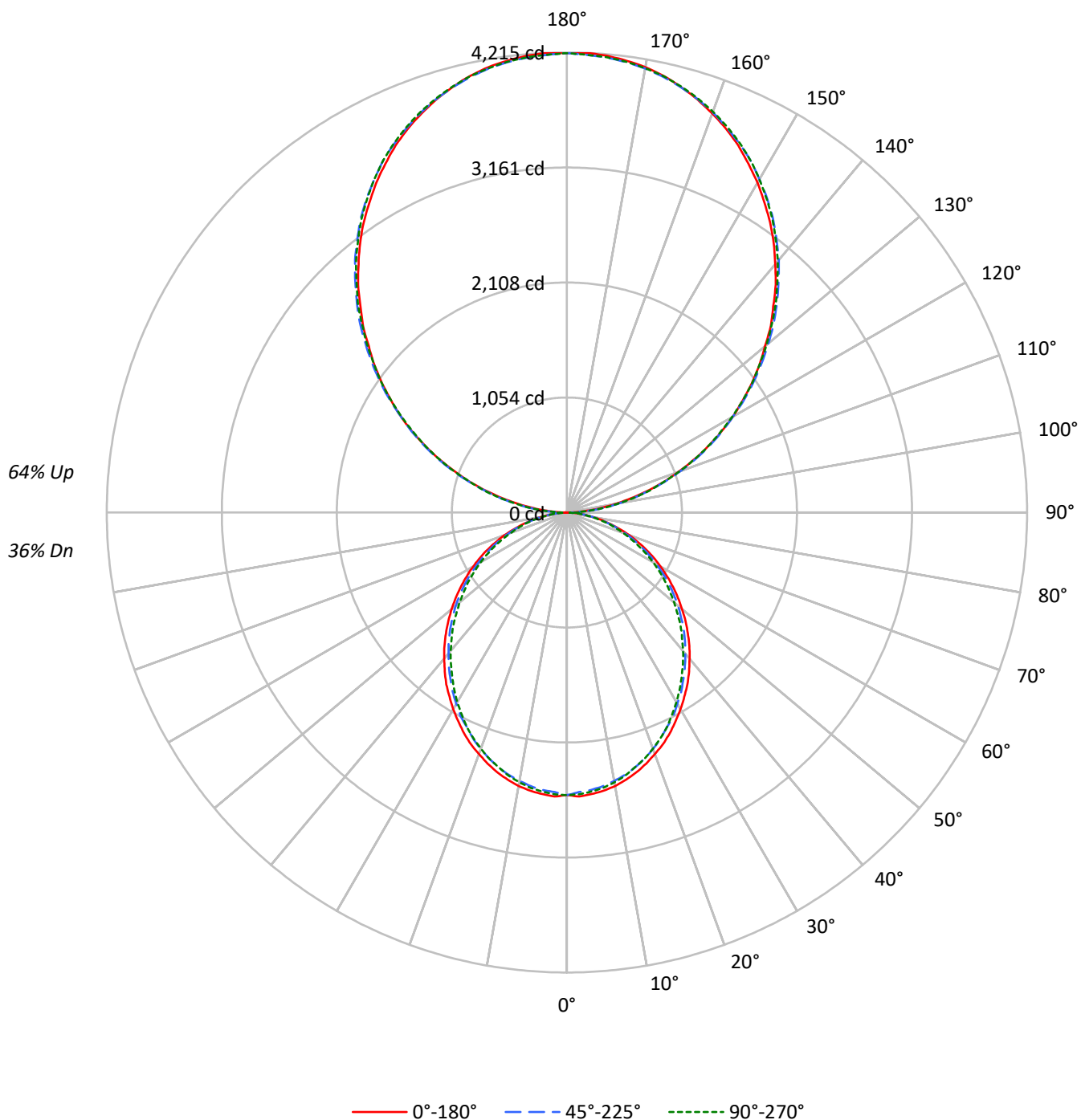
Lumens per Lamp: N/A  
Luminaire Lumens: 18365.0 lumens  
Efficiency: N/A  
Efficacy: 116.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 158.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-PN4F0-060D120US850-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P911432

CATALOG NUMBER: DFN2DIP-PN4F0-060D120US850-FLLFL

**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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 59 | 59 | 59 | 43 | 43 | 43 |
| 1   | 95  | 90  | 87  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 36 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 66 | 62 | 58 | 54 | 51 | 45 | 43 | 41 | 34 | 32 | 31 |
| 3   | 79  | 69  | 62  | 56  | 71 | 63 | 57 | 52 | 51 | 47 | 43 | 40 | 37 | 34 | 30 | 28 | 26 |
| 4   | 72  | 61  | 54  | 48  | 65 | 56 | 49 | 44 | 45 | 40 | 37 | 36 | 32 | 29 | 27 | 24 | 22 |
| 5   | 66  | 54  | 47  | 41  | 59 | 50 | 43 | 38 | 40 | 35 | 31 | 32 | 28 | 25 | 24 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 36 | 31 | 27 | 29 | 25 | 22 | 22 | 19 | 17 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 33 | 28 | 24 | 26 | 22 | 20 | 20 | 17 | 15 |
| 8   | 52  | 40  | 32  | 27  | 47 | 36 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 17 | 18 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 22 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 14 | 12 |
| 10  | 45  | 33  | 26  | 21  | 41 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 17 | 14 | 16 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1890 | 1890 | 1890 |
| 5°  | 1893 | 1864 | 1877 |
| 10° | 1878 | 1839 | 1851 |
| 15° | 1850 | 1809 | 1812 |
| 20° | 1813 | 1767 | 1772 |
| 25° | 1776 | 1717 | 1725 |
| 30° | 1729 | 1671 | 1666 |
| 35° | 1685 | 1616 | 1603 |
| 40° | 1631 | 1560 | 1543 |
| 45° | 1577 | 1505 | 1482 |
| 50° | 1517 | 1446 | 1411 |
| 55° | 1456 | 1379 | 1346 |
| 60° | 1386 | 1299 | 1272 |
| 65° | 1309 | 1216 | 1184 |
| 70° | 1212 | 1114 | 1089 |
| 75° | 1077 | 994  | 1003 |
| 80° | 915  | 839  | 836  |
| 85° | 661  | 572  | 560  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3294 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 243.7   | 1.3       |
| 10°-20°   | 685.6   | 3.7       |
| 20°-30°   | 1007.6  | 5.5       |
| 30°-40°   | 1170.3  | 6.4       |
| 40°-50°   | 1168.8  | 6.4       |
| 50°-60°   | 1019.2  | 5.5       |
| 60°-70°   | 753.4   | 4.1       |
| 70°-80°   | 426.3   | 2.3       |
| 80°-90°   | 124.4   | 0.7       |
| 90°-100°  | 260.4   | 1.4       |
| 100°-110° | 827.5   | 4.5       |
| 110°-120° | 1416.1  | 7.7       |
| 120°-130° | 1862.4  | 10.1      |
| 130°-140° | 2090.5  | 11.4      |
| 140°-150° | 2050.0  | 11.2      |
| 150°-160° | 1719.6  | 9.4       |
| 160°-170° | 1140.4  | 6.2       |
| 170°-180° | 398.6   | 2.2       |
| 0°-30°    | 1937.0  | 10.5      |
| 0°-40°    | 3107.2  | 16.9      |
| 0°-60°    | 5295.3  | 28.8      |
| 0°-90°    | 6599.4  | 35.9      |
| 90°-120°  | 2504.0  | 13.6      |
| 90°-150°  | 8506.9  | 46.3      |
| 90°-180°  | 11766.0 | 64.1      |
| 0°-180°   | 18365.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2589 | 2589  | 2589 | 2589  | 2589 |      |
| 5°   | 2589 | 2579  | 2552 | 2572  | 2567 | 246  |
| 15°  | 2465 | 2450  | 2417 | 2428  | 2415 | 694  |
| 25°  | 2231 | 2211  | 2168 | 2173  | 2168 | 1026 |
| 35°  | 1925 | 1900  | 1860 | 1845  | 1832 | 1202 |
| 45°  | 1566 | 1549  | 1511 | 1484  | 1474 | 1209 |
| 55°  | 1185 | 1170  | 1140 | 1110  | 1098 | 1060 |
| 65°  | 799  | 784   | 759  | 737   | 724  | 790  |
| 75°  | 418  | 413   | 401  | 386   | 391  | 446  |
| 85°  | 102  | 100   | 97   | 90    | 87   | 114  |
| 90°  | 4    | 46    | 124  | 117   | 120  | 18   |
| 95°  | 185  | 221   | 227  | 227   | 221  | 206  |
| 105° | 764  | 774   | 782  | 788   | 788  | 806  |
| 115° | 1421 | 1442  | 1435 | 1431  | 1421 | 1406 |
| 125° | 2067 | 2099  | 2089 | 2077  | 2073 | 1847 |
| 135° | 2674 | 2713  | 2720 | 2717  | 2706 | 2066 |
| 145° | 3246 | 3271  | 3291 | 3295  | 3281 | 2028 |
| 155° | 3711 | 3722  | 3733 | 3751  | 3739 | 1708 |
| 165° | 4038 | 4034  | 4034 | 4059  | 4041 | 1139 |
| 175° | 4201 | 4191  | 4184 | 4209  | 4187 | 399  |
| 180° | 4209 | 4209  | 4209 | 4209  | 4209 |      |

TEST NUMBER: P911432

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2589.1 | 2589.1 | 2589.1 | 2589.1 | 2589.1 |
| 2.5°   | 2604.2 | 2591.7 | 2564.2 | 2589.1 | 2584.3 |
| 5°     | 2589.1 | 2579.3 | 2551.8 | 2571.7 | 2566.9 |
| 7.5°   | 2571.7 | 2556.9 | 2529.4 | 2549.5 | 2544.5 |
| 10°    | 2544.5 | 2527.1 | 2497.1 | 2517.0 | 2509.6 |
| 12.5°  | 2507.0 | 2492.1 | 2462.3 | 2474.7 | 2469.7 |
| 15°    | 2464.6 | 2449.9 | 2417.4 | 2427.5 | 2415.1 |
| 17.5°  | 2412.4 | 2397.7 | 2365.2 | 2377.5 | 2365.2 |
| 20°    | 2355.1 | 2340.3 | 2305.4 | 2312.8 | 2303.1 |
| 22.5°  | 2298.1 | 2275.6 | 2243.1 | 2243.1 | 2238.1 |
| 25°    | 2230.6 | 2210.9 | 2168.5 | 2173.3 | 2168.5 |
| 27.5°  | 2155.9 | 2138.5 | 2106.2 | 2098.9 | 2086.5 |
| 30°    | 2081.5 | 2061.3 | 2024.1 | 2016.7 | 2006.6 |
| 32.5°  | 2001.6 | 1986.9 | 1947.0 | 1931.9 | 1921.9 |
| 35°    | 1924.6 | 1899.7 | 1859.8 | 1844.7 | 1832.3 |
| 37.5°  | 1837.4 | 1814.9 | 1775.1 | 1757.5 | 1745.1 |
| 40°    | 1747.8 | 1727.7 | 1687.9 | 1665.7 | 1655.6 |
| 42.5°  | 1660.6 | 1640.5 | 1601.0 | 1575.9 | 1561.0 |
| 45°    | 1566.1 | 1548.6 | 1511.1 | 1484.0 | 1473.9 |
| 47.5°  | 1473.9 | 1456.4 | 1416.6 | 1389.1 | 1374.3 |
| 50°    | 1376.7 | 1364.3 | 1329.5 | 1294.5 | 1282.1 |
| 52.5°  | 1282.1 | 1264.7 | 1232.4 | 1205.0 | 1187.6 |
| 55°    | 1185.2 | 1170.1 | 1140.3 | 1110.4 | 1098.0 |
| 57.5°  | 1088.0 | 1075.6 | 1043.1 | 1013.3 | 1003.2 |
| 60°    | 990.8  | 981.0  | 946.2  | 918.7  | 911.3  |
| 62.5°  | 896.2  | 878.8  | 853.9  | 829.1  | 819.1  |
| 65°    | 799.3  | 784.3  | 759.4  | 736.9  | 724.5  |
| 67.5°  | 699.7  | 687.0  | 664.8  | 647.4  | 637.3  |
| 70°    | 607.5  | 597.5  | 575.0  | 557.6  | 547.8  |
| 72.5°  | 512.9  | 502.9  | 490.5  | 473.1  | 465.7  |
| 75°    | 418.1  | 413.4  | 400.7  | 385.9  | 390.9  |
| 77.5°  | 333.6  | 323.6  | 318.5  | 311.2  | 303.8  |
| 80°    | 249.1  | 246.4  | 241.4  | 234.0  | 229.0  |
| 82.5°  | 169.3  | 169.3  | 166.9  | 156.9  | 156.9  |
| 85°    | 101.9  | 99.6   | 97.1   | 89.5   | 87.2   |
| 87.5°  | 44.9   | 39.9   | 34.8   | 27.5   | 24.8   |
| 90°    | 3.8    | 45.7   | 124.3  | 116.8  | 120.5  |
| 92.5°  | 78.6   | 106.6  | 110.3  | 114.2  | 114.2  |
| 95°    | 185.2  | 220.8  | 227.1  | 227.1  | 220.8  |
| 97.5°  | 308.3  | 341.4  | 355.3  | 355.3  | 355.3  |
| 100°   | 450.5  | 479.6  | 489.7  | 489.7  | 486.0  |
| 102.5° | 600.2  | 621.7  | 635.7  | 639.6  | 635.7  |
| 105°   | 763.9  | 774.0  | 781.6  | 787.9  | 787.9  |
| 107.5° | 926.2  | 941.5  | 941.5  | 944.0  | 926.2  |
| 110°   | 1083.6 | 1103.9 | 1103.9 | 1103.9 | 1093.8 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1253.6 | 1275.2 | 1271.4 | 1261.3 | 1253.6 |
| 115°   | 1421.1 | 1441.5 | 1435.0 | 1431.3 | 1421.1 |
| 117.5° | 1587.3 | 1615.3 | 1597.5 | 1587.3 | 1577.2 |
| 120°   | 1754.9 | 1782.7 | 1754.9 | 1754.9 | 1743.5 |
| 122.5° | 1907.1 | 1942.6 | 1924.9 | 1914.7 | 1907.1 |
| 125°   | 2067.0 | 2098.7 | 2088.6 | 2077.2 | 2073.3 |
| 127.5° | 2223.1 | 2262.4 | 2248.4 | 2233.2 | 2223.1 |
| 130°   | 2368.9 | 2414.6 | 2408.3 | 2400.7 | 2386.7 |
| 132.5° | 2532.6 | 2568.2 | 2570.7 | 2552.9 | 2542.8 |
| 135°   | 2673.5 | 2712.8 | 2720.5 | 2716.6 | 2706.5 |
| 137.5° | 2830.8 | 2862.6 | 2868.9 | 2866.3 | 2851.1 |
| 140°   | 2969.1 | 3000.8 | 3018.6 | 3018.6 | 3004.6 |
| 142.5° | 3111.3 | 3143.0 | 3153.1 | 3156.9 | 3143.0 |
| 145°   | 3245.7 | 3271.1 | 3291.4 | 3295.3 | 3281.3 |
| 147.5° | 3366.3 | 3398.0 | 3413.3 | 3419.6 | 3405.6 |
| 150°   | 3490.7 | 3512.2 | 3526.2 | 3537.6 | 3526.2 |
| 152.5° | 3601.0 | 3622.5 | 3640.4 | 3654.4 | 3640.4 |
| 155°   | 3711.4 | 3721.6 | 3733.0 | 3750.7 | 3739.3 |
| 157.5° | 3806.6 | 3814.2 | 3820.5 | 3845.9 | 3828.2 |
| 160°   | 3891.6 | 3899.2 | 3903.0 | 3924.6 | 3909.3 |
| 162.5° | 3970.2 | 3970.2 | 3974.1 | 3998.2 | 3980.4 |
| 165°   | 4037.5 | 4033.8 | 4033.8 | 4059.1 | 4041.3 |
| 167.5° | 4098.4 | 4087.0 | 4087.0 | 4112.4 | 4094.6 |
| 170°   | 4144.1 | 4133.9 | 4130.1 | 4155.5 | 4133.9 |
| 172.5° | 4175.8 | 4165.6 | 4161.9 | 4187.3 | 4165.6 |
| 175°   | 4201.2 | 4191.0 | 4183.5 | 4208.8 | 4187.3 |
| 177.5° | 4215.2 | 4205.0 | 4197.3 | 4219.0 | 4197.3 |
| 180°   | 4208.8 | 4208.8 | 4208.8 | 4208.8 | 4208.8 |

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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 | 8.03             | 8.77  | 9.10  | 9.84  | 11.30 | 7.59           | 8.33  | 8.66  | 9.41  | 10.86 |
|                 | 3H   | 9.68             | 10.35 | 10.76 | 11.43 | 12.91 | 9.20           | 9.87  | 10.27 | 10.95 | 12.42 |
|                 | 4H   | 10.26            | 10.90 | 11.35 | 11.98 | 13.46 | 9.78           | 10.41 | 10.87 | 11.49 | 12.98 |
|                 | 6H   | 10.66            | 11.25 | 11.76 | 12.33 | 13.83 | 10.17          | 10.75 | 11.27 | 11.84 | 13.33 |
|                 | 8H   | 10.76            | 11.32 | 11.87 | 12.42 | 13.91 | 10.27          | 10.83 | 11.37 | 11.93 | 13.42 |
|                 | 12H  | 10.81            | 11.34 | 11.92 | 12.43 | 13.95 | 10.31          | 10.84 | 11.42 | 11.93 | 13.45 |
| 4H              | 2H   | 8.47             | 9.11  | 9.57  | 10.19 | 11.67 | 8.12           | 8.76  | 9.22  | 9.84  | 11.32 |
|                 | 3H   | 10.33            | 10.86 | 11.44 | 11.97 | 13.47 | 9.93           | 10.46 | 11.03 | 11.57 | 13.06 |
|                 | 4H   | 11.04            | 11.53 | 12.15 | 12.63 | 14.15 | 10.63          | 11.11 | 11.73 | 12.21 | 13.73 |
|                 | 6H   | 11.56            | 11.97 | 12.67 | 13.09 | 14.60 | 11.13          | 11.55 | 12.25 | 12.67 | 14.18 |
|                 | 8H   | 11.70            | 12.09 | 12.82 | 13.21 | 14.73 | 11.28          | 11.67 | 12.39 | 12.78 | 14.30 |
|                 | 12H  | 11.77            | 12.13 | 12.91 | 13.25 | 14.78 | 11.33          | 11.69 | 12.47 | 12.81 | 14.34 |
| 8H              | 4H   | 11.23            | 11.62 | 12.35 | 12.74 | 14.26 | 10.86          | 11.25 | 11.98 | 12.36 | 13.89 |
|                 | 6H   | 11.86            | 12.18 | 13.00 | 13.34 | 14.86 | 11.49          | 11.81 | 12.62 | 12.96 | 14.48 |
|                 | 8H   | 12.08            | 12.37 | 13.23 | 13.50 | 15.04 | 11.70          | 11.98 | 12.84 | 13.12 | 14.66 |
|                 | 12H  | 12.21            | 12.46 | 13.36 | 13.59 | 15.17 | 11.81          | 12.06 | 12.96 | 13.19 | 14.77 |
| 12H             | 4H   | 11.21            | 11.57 | 12.34 | 12.69 | 14.22 | 10.85          | 11.20 | 11.98 | 12.33 | 13.86 |
|                 | 6H   | 11.89            | 12.17 | 13.03 | 13.31 | 14.85 | 11.53          | 11.81 | 12.67 | 12.94 | 14.49 |
|                 | 8H   | 12.13            | 12.38 | 13.28 | 13.51 | 15.09 | 11.76          | 12.01 | 12.90 | 13.14 | 14.72 |