

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: P919750

Luminaire Tested: DFN2DIP-PN4F0-100D090US935-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919750  
REPORT IS A COMBINATION OF REPORTS P899712 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-100D090US935-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

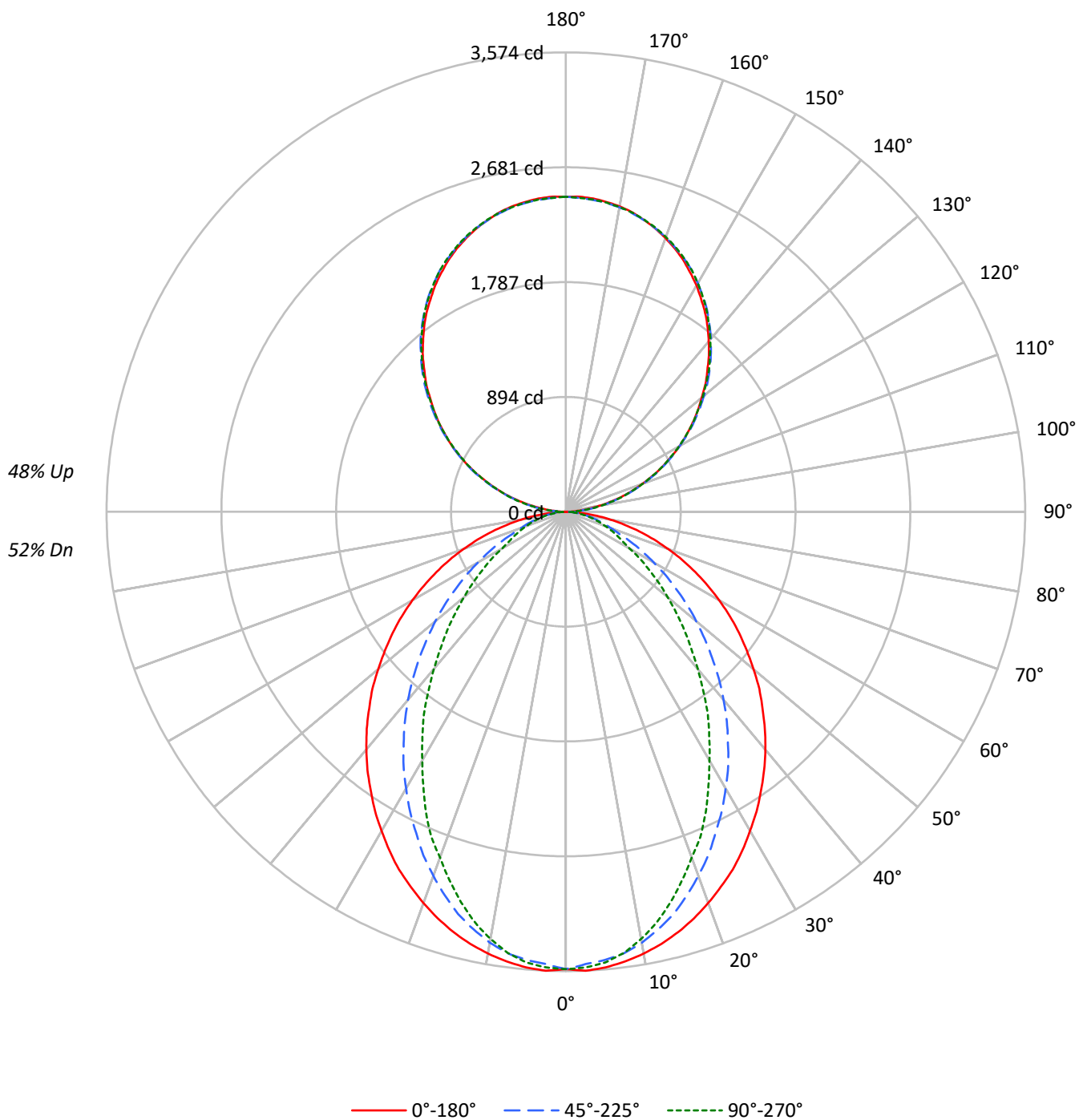
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14176.3 lumens  
Efficiency: N/A  
Efficacy: 84.6 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: General Diffuse  
  
Input Watts (W): 167.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P919750

CATALOG NUMBER: DFN2DIP-PN4F0-100D090US935-RLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P919750

CATALOG NUMBER: DFN2DIP-PN4F0-100D090US935-RLLFLL

**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   | 108 | 108 | 108 | 108 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 58 | 58 | 58 |
| 1   | 99  | 94  | 91  | 87  | 91 | 88 | 84 | 82 | 75 | 72 | 70 | 63 | 61 | 60 | 52 | 51 | 50 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 68 | 66 | 62 | 59 | 56 | 53 | 51 | 46 | 44 | 43 |
| 3   | 83  | 73  | 66  | 61  | 76 | 68 | 62 | 57 | 59 | 54 | 50 | 50 | 46 | 43 | 41 | 39 | 37 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 | 45 | 41 | 38 | 37 | 34 | 32 |
| 5   | 70  | 59  | 51  | 45  | 64 | 55 | 48 | 42 | 47 | 42 | 38 | 40 | 36 | 33 | 34 | 31 | 28 |
| 6   | 64  | 53  | 45  | 39  | 60 | 49 | 42 | 37 | 43 | 37 | 33 | 37 | 32 | 29 | 31 | 28 | 25 |
| 7   | 60  | 48  | 40  | 35  | 55 | 45 | 38 | 33 | 39 | 33 | 29 | 33 | 29 | 26 | 28 | 25 | 23 |
| 8   | 56  | 43  | 36  | 31  | 51 | 41 | 34 | 29 | 36 | 30 | 26 | 31 | 26 | 23 | 26 | 23 | 20 |
| 9   | 52  | 40  | 32  | 28  | 48 | 37 | 31 | 26 | 33 | 27 | 24 | 28 | 24 | 21 | 24 | 21 | 19 |
| 10  | 48  | 37  | 30  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2598 | 2598 | 2598 |
| 5°  | 2602 | 2557 | 2573 |
| 10° | 2576 | 2507 | 2490 |
| 15° | 2540 | 2424 | 2361 |
| 20° | 2494 | 2310 | 2202 |
| 25° | 2446 | 2183 | 2049 |
| 30° | 2381 | 2052 | 1855 |
| 35° | 2318 | 1911 | 1684 |
| 40° | 2253 | 1765 | 1489 |
| 45° | 2179 | 1603 | 1311 |
| 50° | 2101 | 1440 | 1138 |
| 55° | 2021 | 1265 | 971  |
| 60° | 1927 | 1083 | 800  |
| 65° | 1820 | 897  | 721  |
| 70° | 1690 | 724  | 653  |
| 75° | 1526 | 639  | 595  |
| 80° | 1289 | 537  | 518  |
| 85° | 898  | 360  | 392  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2179 cd/sqm

TEST NUMBER: P919750

CATALOG NUMBER: DFN2DIP-PN4F0-100D090US935-RLFL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 333.5   | 2.4       |
| 10°-20°   | 915.5   | 6.5       |
| 20°-30°   | 1285.4  | 9.1       |
| 30°-40°   | 1401.2  | 9.9       |
| 40°-50°   | 1287.8  | 9.1       |
| 50°-60°   | 1011.4  | 7.1       |
| 60°-70°   | 658.3   | 4.6       |
| 70°-80°   | 338.9   | 2.4       |
| 80°-90°   | 93.5    | 0.7       |
| 90°-100°  | 151.6   | 1.1       |
| 100°-110° | 481.8   | 3.4       |
| 110°-120° | 824.6   | 5.8       |
| 120°-130° | 1084.4  | 7.6       |
| 130°-140° | 1217.2  | 8.6       |
| 140°-150° | 1193.6  | 8.4       |
| 150°-160° | 1001.3  | 7.1       |
| 160°-170° | 664.0   | 4.7       |
| 170°-180° | 232.1   | 1.6       |
| 0°-30°    | 2534.4  | 17.9      |
| 0°-40°    | 3935.6  | 27.8      |
| 0°-60°    | 6234.8  | 44.0      |
| 0°-90°    | 7325.4  | 51.7      |
| 90°-120°  | 1458.0  | 10.3      |
| 90°-150°  | 4953.4  | 34.9      |
| 90°-180°  | 6851.0  | 48.3      |
| 0°-180°   | 14176.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3558 | 3558  | 3558 | 3558  | 3558 |      |
| 5°   | 3558 | 3542  | 3500 | 3530  | 3520 | 337  |
| 15°  | 3385 | 3349  | 3240 | 3178  | 3146 | 954  |
| 25°  | 3072 | 2969  | 2757 | 2625  | 2576 | 1413 |
| 35°  | 2647 | 2483  | 2200 | 1997  | 1926 | 1657 |
| 45°  | 2164 | 1948  | 1610 | 1381  | 1304 | 1671 |
| 55°  | 1646 | 1394  | 1046 | 854   | 792  | 1470 |
| 65°  | 1111 | 850   | 560  | 451   | 441  | 1102 |
| 75°  | 592  | 367   | 258  | 235   | 232  | 627  |
| 85°  | 138  | 71    | 61   | 61    | 61   | 159  |
| 90°  | 2    | 27    | 72   | 68    | 70   | 14   |
| 95°  | 108  | 128   | 132  | 132   | 128  | 120  |
| 105° | 445  | 451   | 455  | 459   | 459  | 469  |
| 115° | 828  | 839   | 836  | 833   | 828  | 818  |
| 125° | 1204 | 1222  | 1216 | 1209  | 1207 | 1076 |
| 135° | 1557 | 1580  | 1584 | 1582  | 1576 | 1203 |
| 145° | 1890 | 1905  | 1916 | 1919  | 1911 | 1181 |
| 155° | 2161 | 2167  | 2174 | 2184  | 2177 | 995  |
| 165° | 2351 | 2349  | 2349 | 2364  | 2353 | 663  |
| 175° | 2446 | 2440  | 2436 | 2451  | 2438 | 232  |
| 180° | 2451 | 2451  | 2451 | 2451  | 2451 |      |



TEST NUMBER: P919750

CATALOG NUMBER: DFN2DIP-PN4F0-100D090US935-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3558.5 | 3558.5 | 3558.5 | 3558.5 | 3558.5 |
| 2.5°   | 3574.5 | 3558.5 | 3522.9 | 3555.4 | 3548.9 |
| 5°     | 3558.5 | 3542.4 | 3500.4 | 3529.5 | 3519.8 |
| 7.5°   | 3529.5 | 3510.3 | 3465.2 | 3477.8 | 3461.8 |
| 10°    | 3490.8 | 3468.3 | 3404.0 | 3394.1 | 3375.0 |
| 12.5°  | 3442.7 | 3413.6 | 3326.5 | 3307.4 | 3271.8 |
| 15°    | 3384.6 | 3349.0 | 3239.7 | 3178.5 | 3146.4 |
| 17.5°  | 3316.9 | 3265.3 | 3130.1 | 3059.3 | 3007.7 |
| 20°    | 3239.7 | 3175.1 | 3014.2 | 2933.9 | 2862.8 |
| 22.5°  | 3156.0 | 3081.9 | 2894.9 | 2785.7 | 2737.5 |
| 25°    | 3072.3 | 2969.2 | 2756.6 | 2624.7 | 2576.2 |
| 27.5°  | 2972.5 | 2862.8 | 2627.8 | 2476.4 | 2402.3 |
| 30°    | 2866.3 | 2743.6 | 2486.0 | 2322.0 | 2234.9 |
| 32.5°  | 2763.1 | 2614.8 | 2351.0 | 2157.7 | 2077.0 |
| 35°    | 2647.2 | 2482.9 | 2199.7 | 1996.7 | 1925.6 |
| 37.5°  | 2534.5 | 2357.2 | 2057.9 | 1835.5 | 1755.1 |
| 40°    | 2415.3 | 2222.2 | 1909.6 | 1681.0 | 1597.3 |
| 42.5°  | 2292.9 | 2086.9 | 1761.7 | 1523.2 | 1442.9 |
| 45°    | 2164.1 | 1948.2 | 1610.3 | 1381.4 | 1304.2 |
| 47.5°  | 2041.9 | 1813.3 | 1465.4 | 1236.5 | 1165.8 |
| 50°    | 1906.5 | 1677.9 | 1323.6 | 1101.2 | 1033.9 |
| 52.5°  | 1774.3 | 1532.7 | 1188.3 | 975.8  | 914.6  |
| 55°    | 1645.5 | 1394.4 | 1046.5 | 853.5  | 792.3  |
| 57.5°  | 1513.6 | 1255.9 | 921.2  | 740.7  | 689.1  |
| 60°    | 1378.3 | 1120.7 | 788.9  | 624.9  | 573.3  |
| 62.5°  | 1246.4 | 988.8  | 676.1  | 521.8  | 496.1  |
| 65°    | 1111.1 | 850.1  | 560.3  | 451.0  | 441.1  |
| 67.5°  | 982.3  | 721.3  | 451.0  | 396.0  | 386.4  |
| 70°    | 847.0  | 595.9  | 373.4  | 341.3  | 328.4  |
| 72.5°  | 718.2  | 479.7  | 312.3  | 286.6  | 280.2  |
| 75°    | 592.5  | 367.0  | 257.6  | 235.1  | 232.0  |
| 77.5°  | 467.1  | 260.7  | 202.9  | 189.9  | 183.5  |
| 80°    | 350.9  | 186.9  | 154.5  | 141.8  | 141.8  |
| 82.5°  | 244.6  | 125.7  | 106.2  | 99.8   | 99.8   |
| 85°    | 138.4  | 70.7   | 61.1   | 61.1   | 61.1   |
| 87.5°  | 51.6   | 25.7   | 25.7   | 22.6   | 22.6   |
| 90°    | 2.2    | 26.6   | 72.4   | 67.9   | 70.2   |
| 92.5°  | 45.8   | 62.1   | 64.3   | 66.5   | 66.5   |
| 95°    | 107.9  | 128.5  | 132.2  | 132.2  | 128.5  |
| 97.5°  | 179.5  | 198.7  | 206.9  | 206.9  | 206.9  |
| 100°   | 262.3  | 279.3  | 285.2  | 285.2  | 283.0  |
| 102.5° | 349.5  | 362.0  | 370.1  | 372.4  | 370.1  |
| 105°   | 444.8  | 450.6  | 455.1  | 458.8  | 458.8  |
| 107.5° | 539.3  | 548.2  | 548.2  | 549.7  | 539.3  |
| 110°   | 630.9  | 642.8  | 642.8  | 642.8  | 636.9  |

TEST NUMBER: P919750

CATALOG NUMBER: DFN2DIP-PN4F0-100D090US935-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 730.0  | 742.5  | 740.3  | 734.4  | 730.0  |
| 115°   | 827.5  | 839.3  | 835.6  | 833.4  | 827.5  |
| 117.5° | 924.3  | 940.6  | 930.2  | 924.3  | 918.3  |
| 120°   | 1021.8 | 1038.0 | 1021.8 | 1021.8 | 1015.1 |
| 122.5° | 1110.4 | 1131.2 | 1120.8 | 1114.9 | 1110.4 |
| 125°   | 1203.6 | 1222.0 | 1216.2 | 1209.4 | 1207.3 |
| 127.5° | 1294.4 | 1317.3 | 1309.2 | 1300.4 | 1294.4 |
| 130°   | 1379.4 | 1406.0 | 1402.3 | 1397.8 | 1389.7 |
| 132.5° | 1474.7 | 1495.4 | 1496.8 | 1486.5 | 1480.7 |
| 135°   | 1556.7 | 1579.6 | 1584.1 | 1581.8 | 1576.0 |
| 137.5° | 1648.3 | 1666.8 | 1670.5 | 1669.0 | 1660.2 |
| 140°   | 1728.9 | 1747.3 | 1757.6 | 1757.6 | 1749.5 |
| 142.5° | 1811.6 | 1830.1 | 1836.0 | 1838.2 | 1830.1 |
| 145°   | 1890.0 | 1904.7 | 1916.5 | 1918.7 | 1910.6 |
| 147.5° | 1960.1 | 1978.6 | 1987.4 | 1991.1 | 1983.1 |
| 150°   | 2032.6 | 2045.1 | 2053.2 | 2059.9 | 2053.2 |
| 152.5° | 2096.8 | 2109.4 | 2119.7 | 2127.9 | 2119.7 |
| 155°   | 2161.1 | 2167.0 | 2173.7 | 2184.0 | 2177.4 |
| 157.5° | 2216.5 | 2220.9 | 2224.6 | 2239.4 | 2229.0 |
| 160°   | 2266.0 | 2270.5 | 2272.7 | 2285.2 | 2276.3 |
| 162.5° | 2311.8 | 2311.8 | 2314.0 | 2328.1 | 2317.7 |
| 165°   | 2351.0 | 2348.7 | 2348.7 | 2363.5 | 2353.2 |
| 167.5° | 2386.4 | 2379.8 | 2379.8 | 2394.5 | 2384.2 |
| 170°   | 2413.0 | 2407.1 | 2404.9 | 2419.7 | 2407.1 |
| 172.5° | 2431.5 | 2425.6 | 2423.4 | 2438.2 | 2425.6 |
| 175°   | 2446.3 | 2440.3 | 2435.9 | 2450.7 | 2438.2 |
| 177.5° | 2454.4 | 2448.5 | 2444.0 | 2456.6 | 2444.0 |
| 180°   | 2450.7 | 2450.7 | 2450.7 | 2450.7 | 2450.7 |

TEST NUMBER: P919750

CATALOG NUMBER: DFN2DIP-PN4F0-100D090US935-RLLFLL

**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 | 10.62            | 11.47 | 11.57 | 12.43 | 13.68 | 6.59           | 7.43  | 7.54  | 8.39  | 9.64  |
|                 | 3H   | 12.31            | 13.06 | 13.27 | 14.03 | 15.30 | 7.78           | 8.53  | 8.74  | 9.50  | 10.78 |
|                 | 4H   | 12.92            | 13.63 | 13.89 | 14.60 | 15.89 | 8.23           | 8.94  | 9.21  | 9.92  | 11.20 |
|                 | 6H   | 13.34            | 14.00 | 14.33 | 14.98 | 16.27 | 8.55           | 9.21  | 9.54  | 10.19 | 11.48 |
|                 | 8H   | 13.47            | 14.09 | 14.46 | 15.09 | 16.38 | 8.65           | 9.27  | 9.64  | 10.27 | 11.56 |
|                 | 12H  | 13.53            | 14.13 | 14.53 | 15.12 | 16.43 | 8.69           | 9.28  | 9.69  | 10.27 | 11.59 |
| 4H              | 2H   | 10.64            | 11.36 | 11.62 | 12.33 | 13.61 | 7.19           | 7.90  | 8.17  | 8.88  | 10.16 |
|                 | 3H   | 12.48            | 13.07 | 13.47 | 14.07 | 15.37 | 8.54           | 9.13  | 9.53  | 10.14 | 11.43 |
|                 | 4H   | 13.17            | 13.71 | 14.17 | 14.71 | 16.03 | 9.09           | 9.63  | 10.09 | 10.63 | 11.95 |
|                 | 6H   | 13.69            | 14.16 | 14.70 | 15.18 | 16.49 | 9.51           | 9.98  | 10.52 | 11.00 | 12.31 |
|                 | 8H   | 13.87            | 14.30 | 14.88 | 15.32 | 16.65 | 9.64           | 10.07 | 10.65 | 11.09 | 12.42 |
|                 | 12H  | 13.97            | 14.36 | 15.00 | 15.39 | 16.72 | 9.71           | 10.10 | 10.74 | 11.13 | 12.46 |
| 8H              | 4H   | 13.14            | 13.58 | 14.15 | 14.59 | 15.92 | 9.37           | 9.81  | 10.38 | 10.82 | 12.15 |
|                 | 6H   | 13.71            | 14.07 | 14.75 | 15.13 | 16.45 | 9.89           | 10.25 | 10.93 | 11.31 | 12.64 |
|                 | 8H   | 13.93            | 14.25 | 14.97 | 15.29 | 16.64 | 10.08          | 10.40 | 11.13 | 11.44 | 12.79 |
|                 | 12H  | 14.07            | 14.35 | 15.12 | 15.39 | 16.78 | 10.21          | 10.48 | 11.25 | 11.52 | 12.91 |
| 12H             | 4H   | 13.09            | 13.49 | 14.12 | 14.52 | 15.85 | 9.38           | 9.77  | 10.41 | 10.80 | 12.14 |
|                 | 6H   | 13.69            | 14.00 | 14.73 | 15.04 | 16.39 | 9.94           | 10.26 | 10.99 | 11.30 | 12.65 |
|                 | 8H   | 13.91            | 14.19 | 14.96 | 15.22 | 16.62 | 10.16          | 10.43 | 11.20 | 11.47 | 12.86 |