

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: P922210

Luminaire Tested: DFN2DIP-PN3F0-080D090US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922210  
REPORT IS A COMBINATION OF REPORTS P899606 AND P896399  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-080D090US940-RLLFLL  
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

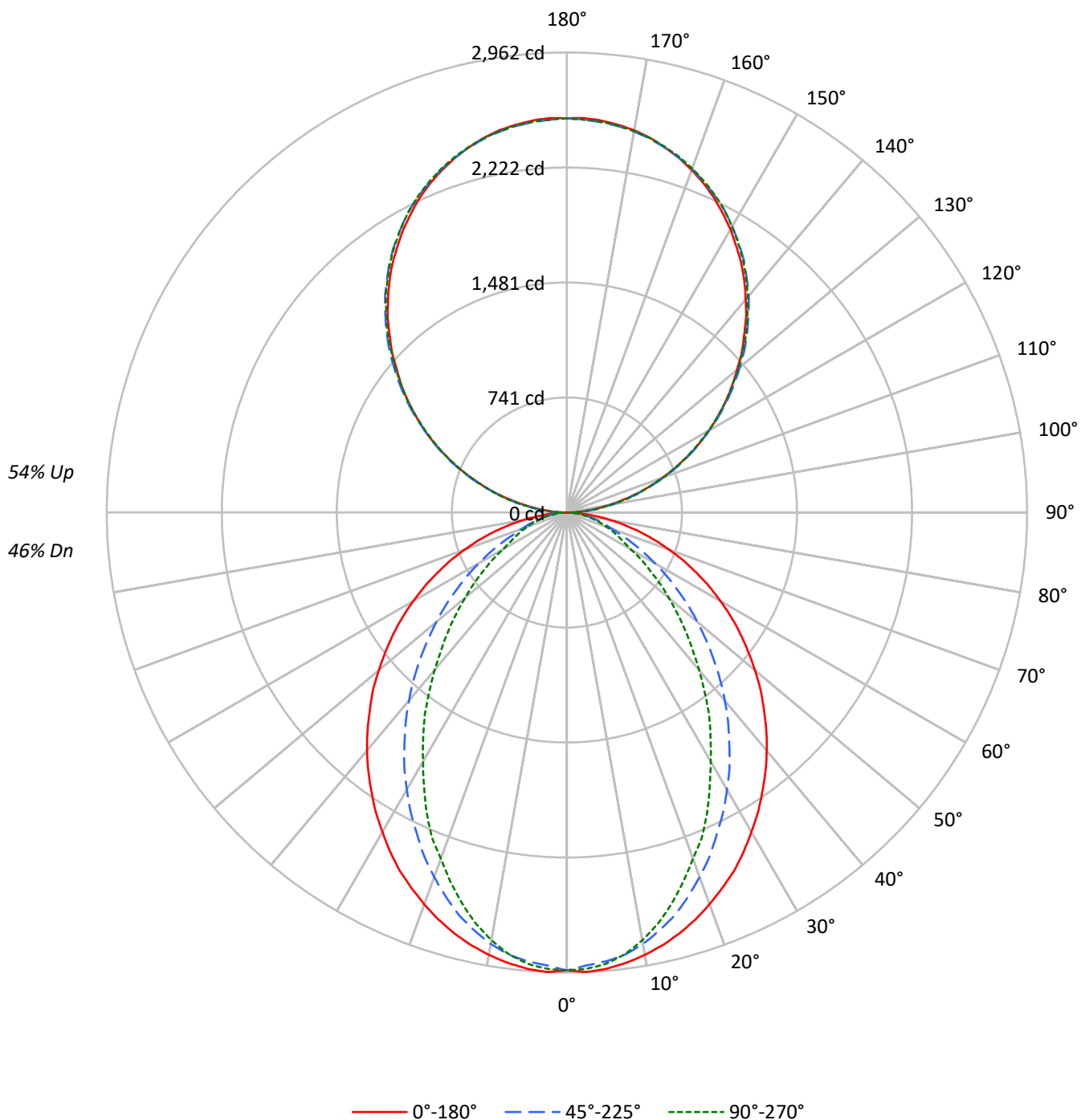
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13166.1 lumens  
Efficiency: N/A  
Efficacy: 87.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 151.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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: P922210

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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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 57 | 56 | 47 | 46 | 45 |
| 2   | 89  | 82  | 76  | 71  | 82 | 75 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 47 | 42 | 40 | 39 |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 33 |
| 4   | 75  | 64  | 57  | 51  | 68 | 59 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 26 | 22 | 20 | 22 | 19 | 17 |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3447 | 3447 | 3447 |
| 5°  | 3450 | 3389 | 3412 |
| 10° | 3414 | 3321 | 3300 |
| 15° | 3365 | 3208 | 3127 |
| 20° | 3301 | 3055 | 2915 |
| 25° | 3235 | 2883 | 2710 |
| 30° | 3147 | 2707 | 2452 |
| 35° | 3061 | 2519 | 2224 |
| 40° | 2974 | 2324 | 1964 |
| 45° | 2872 | 2107 | 1728 |
| 50° | 2767 | 1889 | 1498 |
| 55° | 2657 | 1657 | 1276 |
| 60° | 2529 | 1414 | 1049 |
| 65° | 2382 | 1167 | 942  |
| 70° | 2204 | 937  | 851  |
| 75° | 1980 | 821  | 771  |
| 80° | 1655 | 681  | 663  |
| 85° | 1125 | 443  | 490  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2872 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.3   | 2.1       |
| 10°-20°   | 758.6   | 5.8       |
| 20°-30°   | 1065.0  | 8.1       |
| 30°-40°   | 1160.9  | 8.8       |
| 40°-50°   | 1067.0  | 8.1       |
| 50°-60°   | 838.0   | 6.4       |
| 60°-70°   | 545.4   | 4.1       |
| 70°-80°   | 280.8   | 2.1       |
| 80°-90°   | 78.9    | 0.6       |
| 90°-100°  | 157.1   | 1.2       |
| 100°-110° | 499.0   | 3.8       |
| 110°-120° | 854.0   | 6.5       |
| 120°-130° | 1123.1  | 8.5       |
| 130°-140° | 1260.7  | 9.6       |
| 140°-150° | 1236.2  | 9.4       |
| 150°-160° | 1037.0  | 7.9       |
| 160°-170° | 687.7   | 5.2       |
| 170°-180° | 240.4   | 1.8       |
| 0°-30°    | 2099.9  | 15.9      |
| 0°-40°    | 3260.8  | 24.8      |
| 0°-60°    | 5165.8  | 39.2      |
| 0°-90°    | 6070.9  | 46.1      |
| 90°-120°  | 1510.1  | 11.5      |
| 90°-150°  | 5130.1  | 39.0      |
| 90°-180°  | 7095.0  | 53.9      |
| 0°-180°   | 13166.1 | 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°  | 2    | 28    | 75   | 70    | 73   | 13   |
| 95°  | 112  | 133   | 137  | 137   | 133  | 124  |
| 105° | 461  | 467   | 471  | 475   | 475  | 486  |
| 115° | 857  | 869   | 865  | 863   | 857  | 848  |
| 125° | 1246 | 1266  | 1260 | 1253  | 1250 | 1114 |
| 135° | 1612 | 1636  | 1641 | 1638  | 1632 | 1246 |
| 145° | 1957 | 1973  | 1985 | 1987  | 1979 | 1223 |
| 155° | 2238 | 2244  | 2251 | 2262  | 2255 | 1030 |
| 165° | 2435 | 2432  | 2432 | 2448  | 2437 | 687  |
| 175° | 2534 | 2527  | 2523 | 2538  | 2525 | 241  |
| 180° | 2538 | 2538  | 2538 | 2538  | 2538 |      |

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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°    | 2.3    | 27.6   | 75.0   | 70.4   | 72.7   |
| 92.5°  | 47.4   | 64.3   | 66.6   | 68.8   | 68.8   |
| 95°    | 111.7  | 133.1  | 137.0  | 137.0  | 133.1  |
| 97.5°  | 185.9  | 205.8  | 214.3  | 214.3  | 214.3  |
| 100°   | 271.6  | 289.3  | 295.3  | 295.3  | 293.1  |
| 102.5° | 361.9  | 375.0  | 383.3  | 385.7  | 383.3  |
| 105°   | 460.7  | 466.7  | 471.4  | 475.2  | 475.2  |
| 107.5° | 558.6  | 567.8  | 567.8  | 569.3  | 558.6  |
| 110°   | 653.4  | 665.8  | 665.8  | 665.8  | 659.6  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 756.0  | 769.0  | 766.7  | 760.6  | 756.0  |
| 115°   | 857.0  | 869.2  | 865.4  | 863.2  | 857.0  |
| 117.5° | 957.3  | 974.1  | 963.4  | 957.3  | 951.1  |
| 120°   | 1058.3 | 1075.0 | 1058.3 | 1058.3 | 1051.3 |
| 122.5° | 1150.0 | 1171.5 | 1160.8 | 1154.7 | 1150.0 |
| 125°   | 1246.5 | 1265.6 | 1259.5 | 1252.6 | 1250.4 |
| 127.5° | 1340.6 | 1364.3 | 1355.9 | 1346.8 | 1340.6 |
| 130°   | 1428.6 | 1456.2 | 1452.3 | 1447.7 | 1439.3 |
| 132.5° | 1527.3 | 1548.7 | 1550.2 | 1539.5 | 1533.5 |
| 135°   | 1612.2 | 1635.9 | 1640.6 | 1638.3 | 1632.2 |
| 137.5° | 1707.1 | 1726.3 | 1730.1 | 1728.6 | 1719.4 |
| 140°   | 1790.6 | 1809.6 | 1820.3 | 1820.3 | 1812.0 |
| 142.5° | 1876.2 | 1895.3 | 1901.5 | 1903.8 | 1895.3 |
| 145°   | 1957.4 | 1972.6 | 1984.9 | 1987.2 | 1978.8 |
| 147.5° | 2030.1 | 2049.2 | 2058.3 | 2062.2 | 2053.8 |
| 150°   | 2105.1 | 2118.1 | 2126.5 | 2133.3 | 2126.5 |
| 152.5° | 2171.6 | 2184.6 | 2195.3 | 2203.8 | 2195.3 |
| 155°   | 2238.2 | 2244.3 | 2251.2 | 2261.9 | 2255.0 |
| 157.5° | 2295.5 | 2300.2 | 2304.0 | 2319.2 | 2308.5 |
| 160°   | 2346.8 | 2351.4 | 2353.8 | 2366.7 | 2357.5 |
| 162.5° | 2394.2 | 2394.2 | 2396.6 | 2411.1 | 2400.4 |
| 165°   | 2434.8 | 2432.5 | 2432.5 | 2447.8 | 2437.1 |
| 167.5° | 2471.6 | 2464.7 | 2464.7 | 2479.9 | 2469.2 |
| 170°   | 2499.1 | 2493.0 | 2490.7 | 2506.0 | 2493.0 |
| 172.5° | 2518.2 | 2512.1 | 2509.8 | 2525.1 | 2512.1 |
| 175°   | 2533.5 | 2527.4 | 2522.8 | 2538.2 | 2525.1 |
| 177.5° | 2541.9 | 2535.8 | 2531.2 | 2544.2 | 2531.2 |
| 180°   | 2538.2 | 2538.2 | 2538.2 | 2538.2 | 2538.2 |

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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 | 11.03            | 11.83 | 12.03 | 12.83 | 14.16 | 7.00           | 7.80  | 7.99  | 8.80  | 10.13 |
|                 | 3H   | 12.70            | 13.41 | 13.71 | 14.43 | 15.78 | 8.18           | 8.89  | 9.18  | 9.90  | 11.25 |
|                 | 4H   | 13.30            | 13.98 | 14.32 | 14.99 | 16.35 | 8.62           | 9.30  | 9.64  | 10.31 | 11.67 |
|                 | 6H   | 13.72            | 14.34 | 14.75 | 15.36 | 16.73 | 8.94           | 9.56  | 9.97  | 10.58 | 11.95 |
|                 | 8H   | 13.84            | 14.43 | 14.88 | 15.47 | 16.83 | 9.02           | 9.61  | 10.06 | 10.65 | 12.02 |
|                 | 12H  | 13.90            | 14.46 | 14.94 | 15.49 | 16.88 | 9.06           | 9.62  | 10.10 | 10.65 | 12.04 |
| 4H              | 2H   | 11.04            | 11.72 | 12.07 | 12.73 | 14.09 | 7.59           | 8.26  | 8.61  | 9.28  | 10.63 |
|                 | 3H   | 12.86            | 13.43 | 13.90 | 14.47 | 15.84 | 8.93           | 9.49  | 9.96  | 10.53 | 11.90 |
|                 | 4H   | 13.55            | 14.06 | 14.59 | 15.10 | 16.49 | 9.47           | 9.98  | 10.51 | 11.02 | 12.41 |
|                 | 6H   | 14.06            | 14.50 | 15.11 | 15.56 | 16.95 | 9.88           | 10.32 | 10.93 | 11.38 | 12.77 |
|                 | 8H   | 14.23            | 14.64 | 15.28 | 15.69 | 17.10 | 10.00          | 10.42 | 11.05 | 11.47 | 12.87 |
|                 | 12H  | 14.32            | 14.69 | 15.39 | 15.76 | 17.17 | 10.06          | 10.44 | 11.13 | 11.50 | 12.91 |
| 8H              | 4H   | 13.51            | 13.93 | 14.56 | 14.98 | 16.38 | 9.74           | 10.15 | 10.79 | 11.21 | 12.61 |
|                 | 6H   | 14.07            | 14.41 | 15.15 | 15.51 | 16.91 | 10.25          | 10.59 | 11.33 | 11.68 | 13.09 |
|                 | 8H   | 14.28            | 14.58 | 15.37 | 15.66 | 17.08 | 10.44          | 10.74 | 11.52 | 11.81 | 13.23 |
|                 | 12H  | 14.42            | 14.68 | 15.50 | 15.75 | 17.21 | 10.55          | 10.81 | 11.63 | 11.88 | 13.35 |
| 12H             | 4H   | 13.46            | 13.84 | 14.53 | 14.90 | 16.31 | 9.74           | 10.12 | 10.81 | 11.18 | 12.59 |
|                 | 6H   | 14.05            | 14.35 | 15.13 | 15.42 | 16.84 | 10.30          | 10.60 | 11.38 | 11.67 | 13.10 |
|                 | 8H   | 14.26            | 14.52 | 15.35 | 15.60 | 17.06 | 10.50          | 10.76 | 11.59 | 11.84 | 13.30 |