

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: P908511

Luminaire Tested: DFN2DIP-PN3F0-060D080US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908511  
REPORT IS A COMBINATION OF REPORTS P901108 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-060D080US840-RLLONL  
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

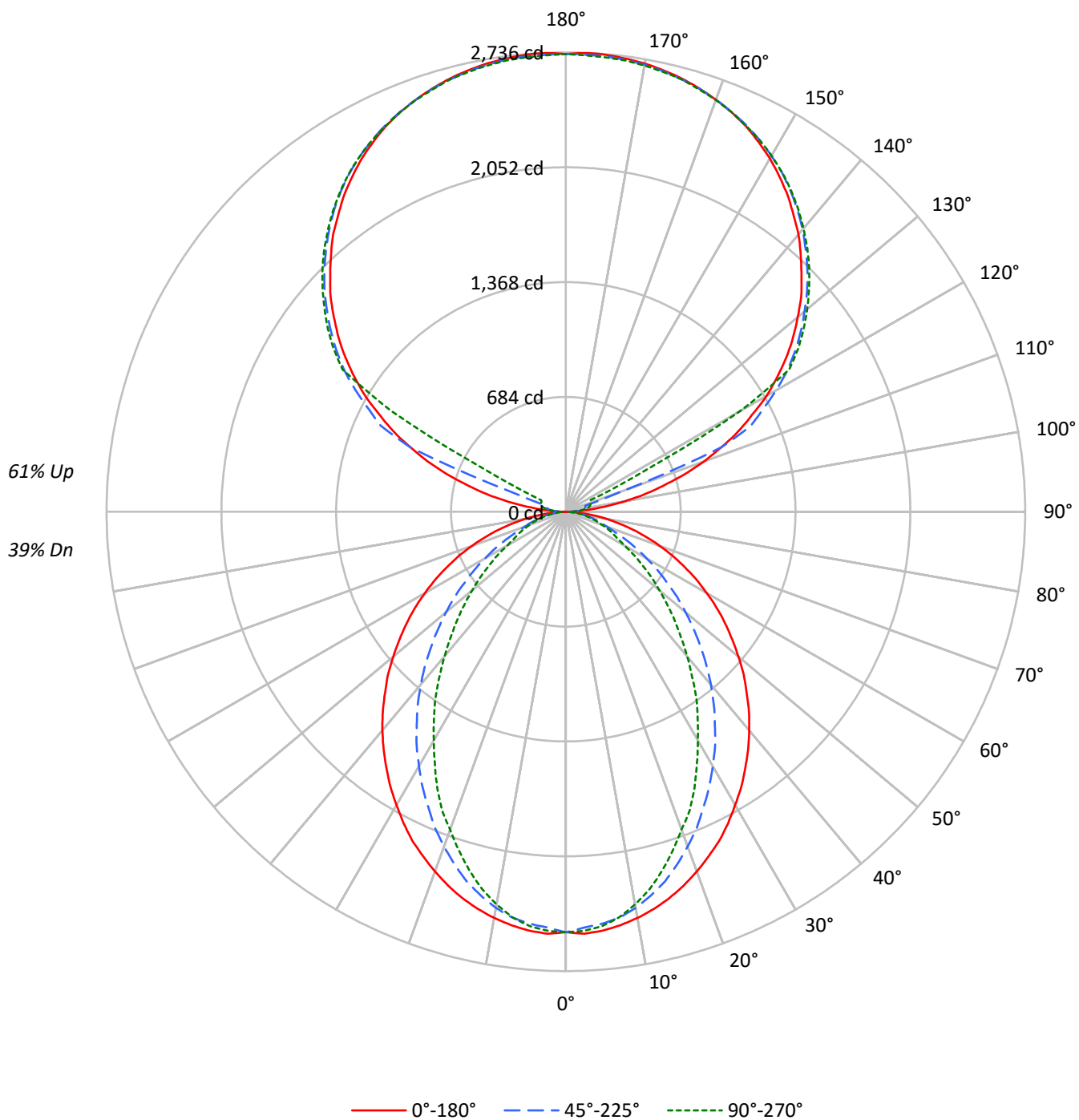
Lumens per Lamp: N/A  
Luminaire Lumens: 13148.5 lumens  
Efficiency: N/A  
Efficacy: 111.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 118.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P908511

CATALOG NUMBER: DFN2DIP-PN3F0-060D080US840-RLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P908511

CATALOG NUMBER: DFN2DIP-PN3F0-060D080US840-RLLONL

**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 | 52 | 41 | 41 | 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  | 67 | 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 | 25 | 23 |
| 6   | 62  | 51  | 43  | 37  | 56 | 46 | 40 | 35 | 39 | 34 | 30 | 31 | 28 | 25 | 25 | 22 | 20 |
| 7   | 57  | 46  | 38  | 33  | 52 | 42 | 35 | 31 | 35 | 30 | 26 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 42  | 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°  | 2927 | 2927 | 2927 |
| 5°  | 2930 | 2879 | 2898 |
| 10° | 2900 | 2820 | 2803 |
| 15° | 2858 | 2725 | 2656 |
| 20° | 2803 | 2595 | 2476 |
| 25° | 2748 | 2449 | 2302 |
| 30° | 2673 | 2300 | 2082 |
| 35° | 2600 | 2139 | 1889 |
| 40° | 2526 | 1973 | 1668 |
| 45° | 2439 | 1790 | 1468 |
| 50° | 2350 | 1605 | 1272 |
| 55° | 2257 | 1407 | 1084 |
| 60° | 2148 | 1201 | 891  |
| 65° | 2023 | 992  | 801  |
| 70° | 1872 | 796  | 723  |
| 75° | 1682 | 698  | 655  |
| 80° | 1406 | 579  | 564  |
| 85° | 955  | 376  | 416  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2439 cd/sqm

TEST NUMBER: P908511

CATALOG NUMBER: DFN2DIP-PN3F0-060D080US840-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 234.7   | 1.8       |
| 10°-20°   | 644.3   | 4.9       |
| 20°-30°   | 904.6   | 6.9       |
| 30°-40°   | 986.1   | 7.5       |
| 40°-50°   | 906.3   | 6.9       |
| 50°-60°   | 711.7   | 5.4       |
| 60°-70°   | 463.3   | 3.5       |
| 70°-80°   | 238.5   | 1.8       |
| 80°-90°   | 65.7    | 0.5       |
| 90°-100°  | 89.9    | 0.7       |
| 100°-110° | 335.1   | 2.5       |
| 110°-120° | 888.9   | 6.8       |
| 120°-130° | 1474.3  | 11.2      |
| 130°-140° | 1566.0  | 11.9      |
| 140°-150° | 1455.4  | 11.1      |
| 150°-160° | 1170.1  | 8.9       |
| 160°-170° | 754.0   | 5.7       |
| 170°-180° | 259.5   | 2.0       |
| 0°-30°    | 1783.6  | 13.6      |
| 0°-40°    | 2769.6  | 21.1      |
| 0°-60°    | 4387.7  | 33.4      |
| 0°-90°    | 5155.1  | 39.2      |
| 90°-120°  | 1314.0  | 10.0      |
| 90°-150°  | 5809.7  | 44.2      |
| 90°-180°  | 7993.0  | 60.8      |
| 0°-180°   | 13148.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2504 | 2504  | 2504 | 2504  | 2504 |      |
| 5°   | 2504 | 2493  | 2463 | 2484  | 2477 | 237  |
| 15°  | 2382 | 2357  | 2280 | 2237  | 2214 | 671  |
| 25°  | 2162 | 2090  | 1940 | 1847  | 1813 | 994  |
| 35°  | 1863 | 1747  | 1548 | 1405  | 1355 | 1166 |
| 45°  | 1523 | 1371  | 1133 | 972   | 918  | 1176 |
| 55°  | 1158 | 981   | 736  | 601   | 558  | 1035 |
| 65°  | 782  | 598   | 394  | 317   | 310  | 775  |
| 75°  | 417  | 258   | 181  | 165   | 163  | 441  |
| 85°  | 97   | 50    | 43   | 43    | 43   | 112  |
| 90°  | 2    | 24    | 39   | 49    | 53   | 12   |
| 95°  | 128  | 63    | 77   | 87    | 85   | 152  |
| 105° | 600  | 659   | 120  | 142   | 150  | 641  |
| 115° | 1134 | 1168  | 1217 | 304   | 162  | 1117 |
| 125° | 1604 | 1630  | 1667 | 1681  | 1687 | 1430 |
| 135° | 1985 | 2016  | 2034 | 2054  | 2050 | 1533 |
| 145° | 2302 | 2300  | 2334 | 2348  | 2338 | 1440 |
| 155° | 2535 | 2518  | 2541 | 2553  | 2537 | 1168 |
| 165° | 2671 | 2660  | 2665 | 2679  | 2665 | 755  |
| 175° | 2732 | 2719  | 2723 | 2736  | 2717 | 260  |
| 180° | 2726 | 2726  | 2726 | 2726  | 2726 |      |

TEST NUMBER: P908511

CATALOG NUMBER: DFN2DIP-PN3F0-060D080US840-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2504.3 | 2504.3 | 2504.3 | 2504.3 | 2504.3 |
| 2.5°   | 2515.6 | 2504.3 | 2479.2 | 2502.0 | 2497.5 |
| 5°     | 2504.3 | 2493.0 | 2463.4 | 2483.9 | 2477.1 |
| 7.5°   | 2483.9 | 2470.3 | 2438.6 | 2447.5 | 2436.2 |
| 10°    | 2456.6 | 2440.7 | 2395.6 | 2388.6 | 2375.1 |
| 12.5°  | 2422.8 | 2402.3 | 2341.0 | 2327.5 | 2302.5 |
| 15°    | 2381.9 | 2356.8 | 2279.9 | 2236.9 | 2214.2 |
| 17.5°  | 2334.3 | 2297.9 | 2202.7 | 2152.9 | 2116.7 |
| 20°    | 2279.9 | 2234.4 | 2121.2 | 2064.7 | 2014.7 |
| 22.5°  | 2221.0 | 2168.8 | 2037.3 | 1960.4 | 1926.4 |
| 25°    | 2162.1 | 2089.5 | 1940.0 | 1847.1 | 1813.0 |
| 27.5°  | 2091.9 | 2014.7 | 1849.3 | 1742.7 | 1690.6 |
| 30°    | 2017.1 | 1930.8 | 1749.5 | 1634.1 | 1572.8 |
| 32.5°  | 1944.5 | 1840.2 | 1654.6 | 1518.4 | 1461.7 |
| 35°    | 1863.0 | 1747.4 | 1548.0 | 1405.1 | 1355.1 |
| 37.5°  | 1783.6 | 1658.8 | 1448.2 | 1291.7 | 1235.2 |
| 40°    | 1699.7 | 1563.9 | 1343.8 | 1183.0 | 1124.1 |
| 42.5°  | 1613.7 | 1468.6 | 1239.7 | 1071.9 | 1015.4 |
| 45°    | 1523.0 | 1371.0 | 1133.3 | 972.1  | 917.8  |
| 47.5°  | 1436.9 | 1276.1 | 1031.3 | 870.2  | 820.4  |
| 50°    | 1341.7 | 1180.8 | 931.5  | 775.0  | 727.6  |
| 52.5°  | 1248.6 | 1078.6 | 836.3  | 686.7  | 643.7  |
| 55°    | 1158.0 | 981.3  | 736.5  | 600.7  | 557.5  |
| 57.5°  | 1065.2 | 883.8  | 648.2  | 521.3  | 484.9  |
| 60°    | 970.0  | 788.7  | 555.2  | 439.8  | 403.4  |
| 62.5°  | 877.2  | 695.9  | 475.8  | 367.2  | 349.1  |
| 65°    | 781.9  | 598.2  | 394.4  | 317.4  | 310.4  |
| 67.5°  | 691.3  | 507.6  | 317.4  | 278.7  | 272.0  |
| 70°    | 596.0  | 419.3  | 262.8  | 240.2  | 231.1  |
| 72.5°  | 505.4  | 337.6  | 219.7  | 201.8  | 197.1  |
| 75°    | 417.0  | 258.2  | 181.3  | 165.4  | 163.3  |
| 77.5°  | 328.7  | 183.5  | 142.8  | 133.7  | 129.2  |
| 80°    | 246.9  | 131.5  | 108.7  | 99.8   | 99.8   |
| 82.5°  | 172.2  | 88.5   | 74.7   | 70.2   | 70.2   |
| 85°    | 97.4   | 49.8   | 43.0   | 43.0   | 43.0   |
| 87.5°  | 36.4   | 18.1   | 18.1   | 15.9   | 15.9   |
| 90°    | 1.9    | 23.6   | 39.4   | 49.4   | 53.2   |
| 92.5°  | 49.4   | 41.5   | 47.4   | 51.3   | 53.2   |
| 95°    | 128.2  | 63.0   | 76.9   | 86.9   | 84.8   |
| 97.5°  | 230.8  | 69.1   | 100.5  | 106.6  | 108.5  |
| 100°   | 349.3  | 79.0   | 112.5  | 128.2  | 132.1  |
| 102.5° | 479.4  | 475.5  | 116.4  | 137.9  | 144.1  |
| 105°   | 599.8  | 659.0  | 120.4  | 142.0  | 150.0  |
| 107.5° | 739.8  | 789.0  | 124.4  | 145.9  | 153.9  |
| 110°   | 874.1  | 915.3  | 345.4  | 148.0  | 155.8  |

TEST NUMBER: P908511

CATALOG NUMBER: DFN2DIP-PN3F0-060D080US840-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1000.4 | 1035.7 | 1002.3 | 151.8  | 157.9  |
| 115°   | 1134.4 | 1167.9 | 1217.3 | 303.9  | 161.9  |
| 117.5° | 1250.8 | 1290.2 | 1323.9 | 1041.6 | 524.8  |
| 120°   | 1381.1 | 1410.6 | 1446.2 | 1469.9 | 1203.5 |
| 122.5° | 1491.4 | 1523.1 | 1562.7 | 1574.4 | 1576.5 |
| 125°   | 1603.9 | 1629.6 | 1667.1 | 1680.9 | 1686.8 |
| 127.5° | 1706.5 | 1734.1 | 1763.9 | 1783.5 | 1785.4 |
| 130°   | 1803.2 | 1834.8 | 1856.4 | 1878.2 | 1876.3 |
| 132.5° | 1901.9 | 1927.6 | 1949.2 | 1967.0 | 1965.1 |
| 135°   | 1984.8 | 2016.4 | 2034.0 | 2054.0 | 2049.9 |
| 137.5° | 2071.5 | 2095.2 | 2115.1 | 2134.8 | 2128.9 |
| 140°   | 2156.3 | 2172.2 | 2193.8 | 2211.6 | 2201.7 |
| 142.5° | 2227.6 | 2241.3 | 2266.8 | 2282.6 | 2272.7 |
| 145°   | 2302.5 | 2300.4 | 2333.9 | 2347.7 | 2337.8 |
| 147.5° | 2367.4 | 2361.6 | 2395.0 | 2404.9 | 2397.1 |
| 150°   | 2430.6 | 2416.8 | 2448.4 | 2460.1 | 2450.3 |
| 152.5° | 2483.9 | 2468.1 | 2497.6 | 2509.6 | 2495.8 |
| 155°   | 2535.2 | 2517.6 | 2541.2 | 2552.9 | 2537.3 |
| 157.5° | 2576.6 | 2560.9 | 2578.7 | 2592.5 | 2576.6 |
| 160°   | 2612.2 | 2600.3 | 2612.2 | 2623.9 | 2610.1 |
| 162.5° | 2643.6 | 2631.9 | 2641.7 | 2655.5 | 2637.8 |
| 165°   | 2671.3 | 2659.6 | 2665.4 | 2679.2 | 2665.4 |
| 167.5° | 2693.0 | 2681.1 | 2687.2 | 2701.0 | 2683.2 |
| 170°   | 2710.9 | 2698.9 | 2702.9 | 2716.7 | 2698.9 |
| 172.5° | 2722.6 | 2710.9 | 2714.8 | 2728.7 | 2710.9 |
| 175°   | 2732.4 | 2718.6 | 2722.6 | 2736.3 | 2716.7 |
| 177.5° | 2736.3 | 2722.6 | 2724.6 | 2738.5 | 2720.7 |
| 180°   | 2726.5 | 2726.5 | 2726.5 | 2726.5 | 2726.5 |

TEST NUMBER: P908511

CATALOG NUMBER: DFN2DIP-PN3F0-060D080US840-RLONL

**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 | 9.74             | 10.49 | 10.79 | 11.54 | 12.96 | 5.71           | 6.46 | 6.76  | 7.51  | 8.93  |
|                 | 3H   | 11.41            | 12.08 | 12.47 | 13.14 | 14.57 | 6.88           | 7.55 | 7.94  | 8.61  | 10.05 |
|                 | 4H   | 12.01            | 12.64 | 13.08 | 13.70 | 15.15 | 7.33           | 7.96 | 8.40  | 9.02  | 10.47 |
|                 | 6H   | 12.42            | 13.00 | 13.50 | 14.07 | 15.53 | 7.64           | 8.22 | 8.72  | 9.29  | 10.74 |
|                 | 8H   | 12.54            | 13.10 | 13.63 | 14.18 | 15.63 | 7.72           | 8.28 | 8.81  | 9.36  | 10.81 |
|                 | 12H  | 12.60            | 13.13 | 13.69 | 14.20 | 15.68 | 7.76           | 8.29 | 8.85  | 9.36  | 10.84 |
| 4H              | 2H   | 9.75             | 10.38 | 10.83 | 11.44 | 12.89 | 6.29           | 6.92 | 7.37  | 7.99  | 9.43  |
|                 | 3H   | 11.56            | 12.09 | 12.65 | 13.18 | 14.64 | 7.63           | 8.15 | 8.71  | 9.24  | 10.70 |
|                 | 4H   | 12.25            | 12.73 | 13.34 | 13.81 | 15.29 | 8.17           | 8.65 | 9.26  | 9.73  | 11.21 |
|                 | 6H   | 12.75            | 13.17 | 13.85 | 14.27 | 15.74 | 8.57           | 8.99 | 9.67  | 10.09 | 11.56 |
|                 | 8H   | 12.92            | 13.31 | 14.02 | 14.40 | 15.89 | 8.70           | 9.08 | 9.80  | 10.18 | 11.67 |
|                 | 12H  | 13.01            | 13.36 | 14.13 | 14.47 | 15.96 | 8.76           | 9.11 | 9.87  | 10.21 | 11.71 |
| 8H              | 4H   | 12.21            | 12.59 | 13.31 | 13.69 | 15.18 | 8.44           | 8.82 | 9.53  | 9.92  | 11.41 |
|                 | 6H   | 12.76            | 13.08 | 13.88 | 14.22 | 15.71 | 8.94           | 9.26 | 10.06 | 10.40 | 11.89 |
|                 | 8H   | 12.98            | 13.26 | 14.10 | 14.37 | 15.88 | 9.13           | 9.41 | 10.26 | 10.53 | 12.03 |
|                 | 12H  | 13.11            | 13.35 | 14.24 | 14.47 | 16.01 | 9.24           | 9.49 | 10.37 | 10.60 | 12.14 |
| 12H             | 4H   | 12.16            | 12.51 | 13.27 | 13.61 | 15.11 | 8.44           | 8.79 | 9.55  | 9.89  | 11.39 |
|                 | 6H   | 12.74            | 13.02 | 13.87 | 14.14 | 15.64 | 8.99           | 9.27 | 10.12 | 10.39 | 11.89 |
|                 | 8H   | 12.95            | 13.20 | 14.08 | 14.31 | 15.85 | 9.19           | 9.44 | 10.32 | 10.55 | 12.10 |