

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: P922771

Luminaire Tested: DFN2DIP-SQ3F0-050D100US940-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922771  
REPORT IS A COMBINATION OF REPORTS P901492 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-050D100US940-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

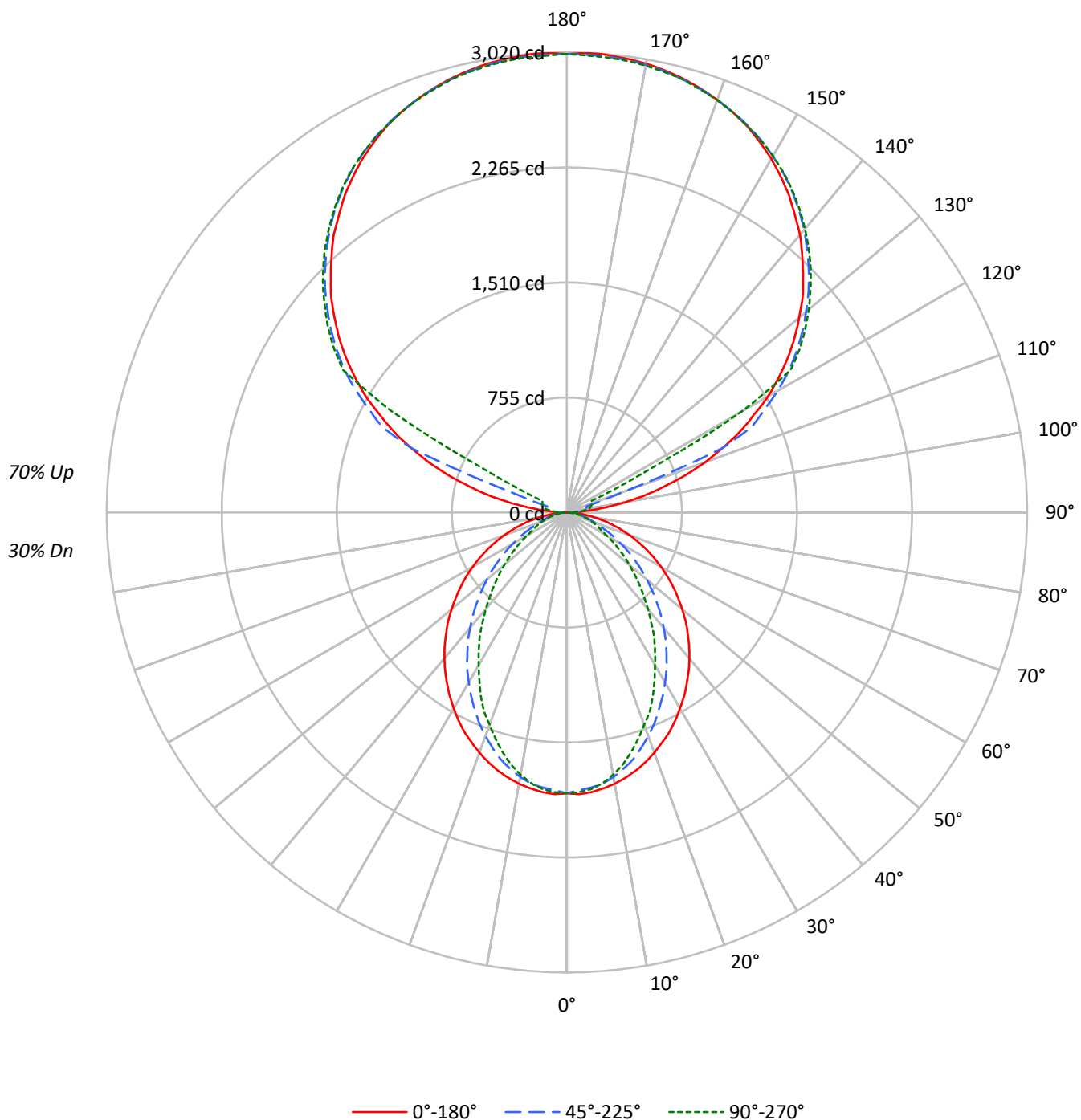
Lumens per Lamp: N/A  
Luminaire Lumens: 12617.8 lumens  
Efficiency: N/A  
Efficacy: 105.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 119.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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



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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   | 102 | 102 | 102 | 102 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 38 | 38 | 38 |
| 1   | 94  | 90  | 86  | 83  | 84 | 81 | 77 | 75 | 64 | 62 | 60 | 48 | 47 | 46 | 34 | 33 | 32 |
| 2   | 85  | 78  | 73  | 68  | 76 | 71 | 66 | 62 | 56 | 53 | 50 | 43 | 40 | 39 | 30 | 29 | 28 |
| 3   | 78  | 69  | 62  | 57  | 70 | 62 | 57 | 52 | 50 | 46 | 42 | 38 | 35 | 33 | 27 | 25 | 24 |
| 4   | 71  | 61  | 54  | 48  | 64 | 55 | 49 | 44 | 44 | 40 | 36 | 34 | 31 | 28 | 24 | 22 | 21 |
| 5   | 66  | 55  | 47  | 41  | 59 | 49 | 43 | 38 | 40 | 35 | 31 | 30 | 27 | 25 | 22 | 20 | 18 |
| 6   | 60  | 49  | 41  | 36  | 54 | 44 | 38 | 33 | 36 | 31 | 27 | 28 | 24 | 22 | 20 | 18 | 16 |
| 7   | 56  | 44  | 37  | 31  | 50 | 40 | 34 | 29 | 32 | 28 | 24 | 25 | 22 | 19 | 18 | 16 | 15 |
| 8   | 52  | 40  | 33  | 28  | 46 | 36 | 30 | 25 | 29 | 25 | 21 | 23 | 20 | 17 | 17 | 15 | 13 |
| 9   | 48  | 37  | 29  | 25  | 43 | 33 | 27 | 23 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 27  | 22  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 16 | 14 | 14 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2111 | 2111 | 2111 |
| 5°  | 2113 | 2077 | 2090 |
| 10° | 2091 | 2034 | 2022 |
| 15° | 2061 | 1966 | 1916 |
| 20° | 2022 | 1872 | 1786 |
| 25° | 1981 | 1767 | 1661 |
| 30° | 1928 | 1659 | 1503 |
| 35° | 1875 | 1543 | 1364 |
| 40° | 1821 | 1424 | 1204 |
| 45° | 1759 | 1292 | 1060 |
| 50° | 1694 | 1158 | 919  |
| 55° | 1626 | 1016 | 783  |
| 60° | 1548 | 867  | 644  |
| 65° | 1458 | 716  | 579  |
| 70° | 1348 | 575  | 523  |
| 75° | 1211 | 504  | 474  |
| 80° | 1012 | 418  | 409  |
| 85° | 687  | 273  | 304  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2061 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 172.7   | 1.4       |
| 10°-20°   | 474.1   | 3.8       |
| 20°-30°   | 665.6   | 5.3       |
| 30°-40°   | 725.6   | 5.8       |
| 40°-50°   | 666.9   | 5.3       |
| 50°-60°   | 523.7   | 4.2       |
| 60°-70°   | 340.9   | 2.7       |
| 70°-80°   | 175.5   | 1.4       |
| 80°-90°   | 50.1    | 0.4       |
| 90°-100°  | 99.2    | 0.8       |
| 100°-110° | 369.9   | 2.9       |
| 110°-120° | 981.1   | 7.8       |
| 120°-130° | 1627.2  | 12.9      |
| 130°-140° | 1728.5  | 13.7      |
| 140°-150° | 1606.5  | 12.7      |
| 150°-160° | 1291.5  | 10.2      |
| 160°-170° | 832.2   | 6.6       |
| 170°-180° | 286.4   | 2.3       |
| 0°-30°    | 1312.4  | 10.4      |
| 0°-40°    | 2038.0  | 16.2      |
| 0°-60°    | 3228.6  | 25.6      |
| 0°-90°    | 3795.1  | 30.1      |
| 90°-120°  | 1450.3  | 11.5      |
| 90°-150°  | 6412.5  | 50.8      |
| 90°-180°  | 8823.0  | 69.9      |
| 0°-180°   | 12617.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1843 | 1843  | 1843 | 1843  | 1843 |      |
| 5°   | 1843 | 1834  | 1813 | 1828  | 1823 | 175  |
| 15°  | 1753 | 1734  | 1678 | 1646  | 1629 | 494  |
| 25°  | 1591 | 1538  | 1427 | 1359  | 1334 | 732  |
| 35°  | 1371 | 1286  | 1139 | 1034  | 997  | 858  |
| 45°  | 1121 | 1009  | 834  | 715   | 675  | 865  |
| 55°  | 852  | 722   | 542  | 442   | 410  | 761  |
| 65°  | 575  | 440   | 290  | 234   | 228  | 570  |
| 75°  | 307  | 190   | 133  | 122   | 120  | 324  |
| 85°  | 72   | 37    | 32   | 32    | 32   | 82   |
| 90°  | 2    | 26    | 43   | 55    | 59   | 12   |
| 95°  | 141  | 70    | 85   | 96    | 94   | 168  |
| 105° | 662  | 727   | 133  | 157   | 166  | 707  |
| 115° | 1252 | 1289  | 1344 | 335   | 179  | 1233 |
| 125° | 1770 | 1799  | 1840 | 1855  | 1862 | 1579 |
| 135° | 2191 | 2226  | 2245 | 2267  | 2263 | 1692 |
| 145° | 2541 | 2539  | 2576 | 2591  | 2580 | 1589 |
| 155° | 2798 | 2779  | 2805 | 2818  | 2800 | 1289 |
| 165° | 2948 | 2935  | 2942 | 2957  | 2942 | 833  |
| 175° | 3016 | 3001  | 3005 | 3020  | 2999 | 287  |
| 180° | 3009 | 3009  | 3009 | 3009  | 3009 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1842.7 | 1842.7 | 1842.7 | 1842.7 | 1842.7 |
| 2.5°   | 1851.0 | 1842.7 | 1824.4 | 1841.1 | 1837.7 |
| 5°     | 1842.7 | 1834.4 | 1812.7 | 1827.6 | 1822.7 |
| 7.5°   | 1827.6 | 1817.8 | 1794.4 | 1801.0 | 1792.6 |
| 10°    | 1807.7 | 1796.0 | 1762.7 | 1757.7 | 1747.7 |
| 12.5°  | 1782.7 | 1767.7 | 1722.6 | 1712.7 | 1694.2 |
| 15°    | 1752.7 | 1734.3 | 1677.7 | 1646.0 | 1629.3 |
| 17.5°  | 1717.6 | 1691.0 | 1620.9 | 1584.2 | 1557.5 |
| 20°    | 1677.7 | 1644.2 | 1560.8 | 1519.3 | 1482.5 |
| 22.5°  | 1634.3 | 1595.9 | 1499.1 | 1442.5 | 1417.6 |
| 25°    | 1590.9 | 1537.5 | 1427.4 | 1359.1 | 1334.0 |
| 27.5°  | 1539.3 | 1482.5 | 1360.8 | 1282.4 | 1244.0 |
| 30°    | 1484.3 | 1420.8 | 1287.4 | 1202.4 | 1157.3 |
| 32.5°  | 1430.8 | 1354.1 | 1217.5 | 1117.3 | 1075.6 |
| 35°    | 1370.8 | 1285.8 | 1139.1 | 1033.9 | 997.2  |
| 37.5°  | 1312.4 | 1220.7 | 1065.7 | 950.5  | 908.9  |
| 40°    | 1250.7 | 1150.8 | 988.8  | 870.5  | 827.2  |
| 42.5°  | 1187.4 | 1080.7 | 912.2  | 788.7  | 747.2  |
| 45°    | 1120.7 | 1008.9 | 833.8  | 715.3  | 675.3  |
| 47.5°  | 1057.3 | 939.0  | 758.8  | 640.3  | 603.7  |
| 50°    | 987.3  | 868.9  | 685.5  | 570.2  | 535.4  |
| 52.5°  | 918.8  | 793.7  | 615.4  | 505.3  | 473.7  |
| 55°    | 852.1  | 722.0  | 541.9  | 441.9  | 410.3  |
| 57.5°  | 783.8  | 650.4  | 477.0  | 383.6  | 356.9  |
| 60°    | 713.7  | 580.3  | 408.5  | 323.6  | 296.9  |
| 62.5°  | 645.4  | 512.0  | 350.2  | 270.2  | 256.9  |
| 65°    | 575.3  | 440.2  | 290.2  | 233.5  | 228.5  |
| 67.5°  | 508.6  | 373.5  | 233.5  | 205.1  | 200.1  |
| 70°    | 438.6  | 308.5  | 193.4  | 176.7  | 170.0  |
| 72.5°  | 371.9  | 248.4  | 161.8  | 148.5  | 145.1  |
| 75°    | 306.8  | 190.0  | 133.4  | 121.7  | 120.1  |
| 77.5°  | 241.8  | 135.0  | 105.1  | 98.4   | 95.0   |
| 80°    | 181.7  | 96.8   | 80.0   | 73.4   | 73.4   |
| 82.5°  | 126.7  | 65.1   | 55.0   | 51.6   | 51.6   |
| 85°    | 71.7   | 36.6   | 31.7   | 31.7   | 31.7   |
| 87.5°  | 26.8   | 13.3   | 13.3   | 11.7   | 11.7   |
| 90°    | 2.1    | 26.1   | 43.4   | 54.6   | 58.7   |
| 92.5°  | 54.6   | 45.7   | 52.3   | 56.6   | 58.7   |
| 95°    | 141.4  | 69.6   | 84.8   | 95.9   | 93.6   |
| 97.5°  | 254.7  | 76.2   | 110.9  | 117.6  | 119.8  |
| 100°   | 385.6  | 87.1   | 124.1  | 141.4  | 145.9  |
| 102.5° | 529.1  | 524.9  | 128.5  | 152.3  | 159.0  |
| 105°   | 662.0  | 727.4  | 133.0  | 156.7  | 165.5  |
| 107.5° | 816.6  | 870.9  | 137.3  | 161.1  | 169.9  |
| 110°   | 964.7  | 1010.3 | 381.1  | 163.5  | 171.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1104.1 | 1143.2 | 1106.3 | 167.6  | 174.3  |
| 115°   | 1252.1 | 1289.1 | 1343.6 | 335.4  | 178.7  |
| 117.5° | 1380.5 | 1424.1 | 1461.2 | 1149.7 | 579.3  |
| 120°   | 1524.4 | 1556.9 | 1596.3 | 1622.4 | 1328.4 |
| 122.5° | 1646.2 | 1681.1 | 1724.7 | 1737.7 | 1740.0 |
| 125°   | 1770.3 | 1798.8 | 1840.1 | 1855.4 | 1861.8 |
| 127.5° | 1883.6 | 1914.1 | 1946.9 | 1968.6 | 1970.7 |
| 130°   | 1990.3 | 2025.3 | 2049.1 | 2073.0 | 2071.0 |
| 132.5° | 2099.2 | 2127.6 | 2151.4 | 2171.0 | 2169.0 |
| 135°   | 2190.8 | 2225.6 | 2245.1 | 2267.0 | 2262.6 |
| 137.5° | 2286.4 | 2312.6 | 2334.5 | 2356.3 | 2349.7 |
| 140°   | 2380.0 | 2397.6 | 2421.4 | 2441.1 | 2430.2 |
| 142.5° | 2458.6 | 2473.9 | 2502.1 | 2519.3 | 2508.6 |
| 145°   | 2541.4 | 2539.1 | 2576.1 | 2591.3 | 2580.4 |
| 147.5° | 2613.0 | 2606.6 | 2643.5 | 2654.4 | 2645.9 |
| 150°   | 2682.8 | 2667.6 | 2702.5 | 2715.4 | 2704.6 |
| 152.5° | 2741.5 | 2724.2 | 2756.8 | 2769.9 | 2754.7 |
| 155°   | 2798.2 | 2778.7 | 2804.9 | 2817.8 | 2800.5 |
| 157.5° | 2843.9 | 2826.6 | 2846.3 | 2861.5 | 2843.9 |
| 160°   | 2883.3 | 2870.1 | 2883.3 | 2896.2 | 2880.9 |
| 162.5° | 2917.9 | 2904.9 | 2915.8 | 2931.1 | 2911.4 |
| 165°   | 2948.4 | 2935.4 | 2941.9 | 2957.2 | 2941.9 |
| 167.5° | 2972.4 | 2959.2 | 2966.0 | 2981.3 | 2961.5 |
| 170°   | 2992.0 | 2978.9 | 2983.3 | 2998.6 | 2978.9 |
| 172.5° | 3005.0 | 2992.0 | 2996.5 | 3011.8 | 2992.0 |
| 175°   | 3015.9 | 3000.6 | 3005.0 | 3020.3 | 2998.6 |
| 177.5° | 3020.3 | 3005.0 | 3007.4 | 3022.6 | 3002.9 |
| 180°   | 3009.4 | 3009.4 | 3009.4 | 3009.4 | 3009.4 |

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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 | 7.49             | 8.18  | 8.60  | 9.29  | 10.82 | 3.45           | 4.14 | 4.57 | 5.25 | 6.78 |
|                 | 3H   | 9.15             | 9.77  | 10.27 | 10.88 | 12.43 | 4.62           | 5.24 | 5.74 | 6.35 | 7.90 |
|                 | 4H   | 9.75             | 10.33 | 10.88 | 11.45 | 13.00 | 5.06           | 5.65 | 6.19 | 6.76 | 8.32 |
|                 | 6H   | 10.16            | 10.70 | 11.30 | 11.82 | 13.38 | 5.37           | 5.91 | 6.51 | 7.03 | 8.59 |
|                 | 8H   | 10.28            | 10.79 | 11.43 | 11.93 | 13.48 | 5.45           | 5.96 | 6.60 | 7.10 | 8.65 |
|                 | 12H  | 10.34            | 10.82 | 11.48 | 11.95 | 13.53 | 5.49           | 5.97 | 6.64 | 7.10 | 8.68 |
| 4H              | 2H   | 7.49             | 8.07  | 8.63  | 9.19  | 10.74 | 4.03           | 4.61 | 5.17 | 5.73 | 7.28 |
|                 | 3H   | 9.30             | 9.79  | 10.44 | 10.93 | 12.49 | 5.35           | 5.84 | 6.50 | 6.98 | 8.55 |
|                 | 4H   | 9.98             | 10.43 | 11.13 | 11.56 | 13.15 | 5.89           | 6.34 | 7.04 | 7.47 | 9.06 |
|                 | 6H   | 10.48            | 10.87 | 11.64 | 12.02 | 13.60 | 6.30           | 6.68 | 7.45 | 7.83 | 9.41 |
|                 | 8H   | 10.65            | 11.01 | 11.81 | 12.16 | 13.75 | 6.42           | 6.78 | 7.57 | 7.92 | 9.51 |
|                 | 12H  | 10.74            | 11.06 | 11.91 | 12.22 | 13.82 | 6.47           | 6.80 | 7.64 | 7.95 | 9.55 |
| 8H              | 4H   | 9.94             | 10.29 | 11.09 | 11.44 | 13.03 | 6.16           | 6.52 | 7.31 | 7.66 | 9.25 |
|                 | 6H   | 10.49            | 10.79 | 11.67 | 11.98 | 13.56 | 6.66           | 6.96 | 7.84 | 8.15 | 9.74 |
|                 | 8H   | 10.71            | 10.96 | 11.89 | 12.13 | 13.74 | 6.85           | 7.11 | 8.03 | 8.27 | 9.88 |
|                 | 12H  | 10.83            | 11.06 | 12.02 | 12.22 | 13.87 | 6.96           | 7.18 | 8.14 | 8.35 | 9.99 |
| 12H             | 4H   | 9.88             | 10.21 | 11.05 | 11.36 | 12.96 | 6.16           | 6.48 | 7.33 | 7.64 | 9.24 |
|                 | 6H   | 10.47            | 10.72 | 11.65 | 11.89 | 13.50 | 6.71           | 6.97 | 7.89 | 8.13 | 9.74 |
|                 | 8H   | 10.68            | 10.90 | 11.86 | 12.07 | 13.71 | 6.91           | 7.13 | 8.09 | 8.30 | 9.94 |