

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: P911721

Luminaire Tested: DFN2DIP-SQ2F0-050D080US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911721  
REPORT IS A COMBINATION OF REPORTS P901355 AND P898215  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-050D080US850-FLLONL  
Description: 2 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

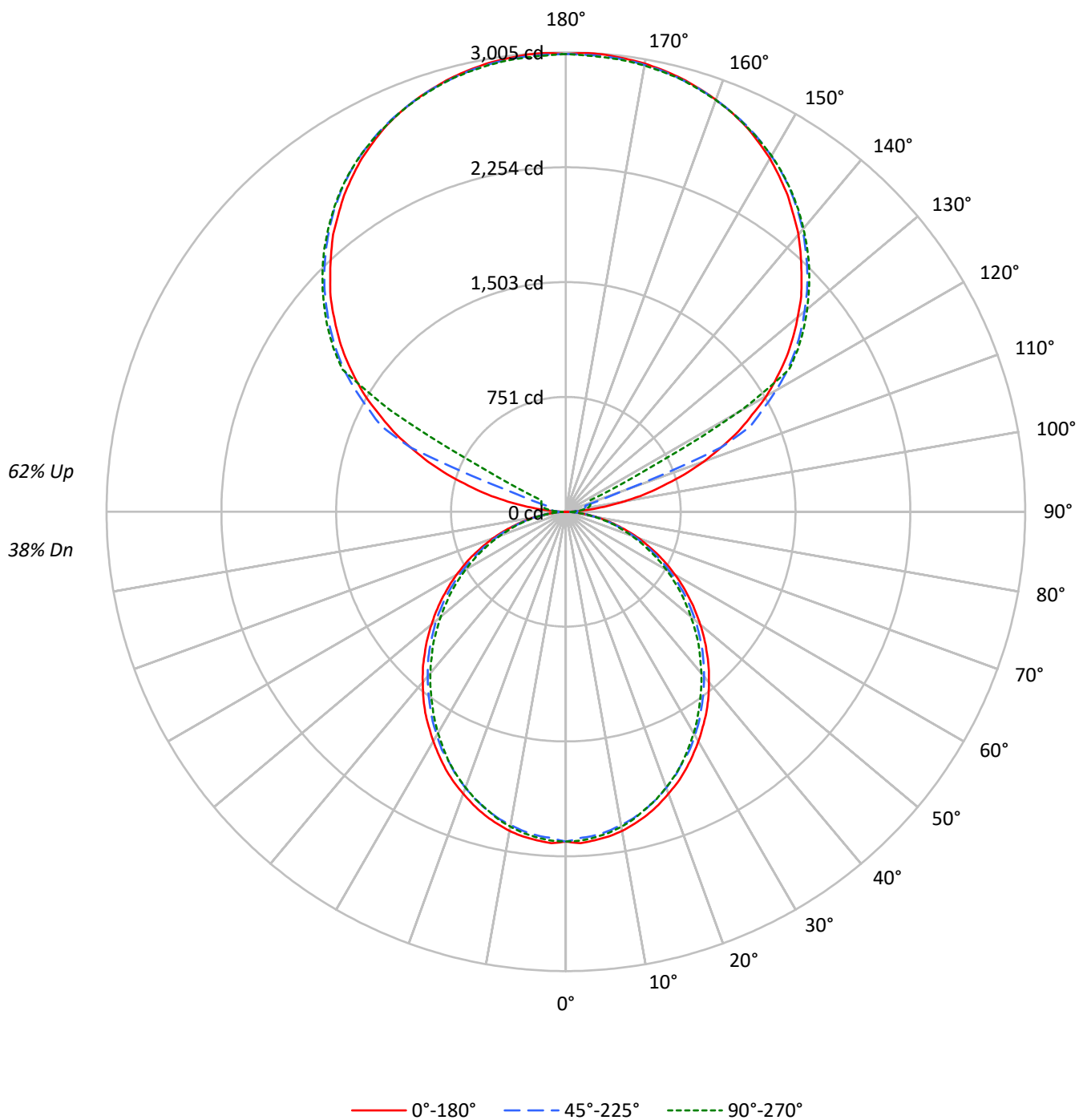
Lumens per Lamp: N/A  
Luminaire Lumens: 14272.9 lumens  
Efficiency: N/A  
Efficacy: 130.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 109.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
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   | 104 | 104 | 104 | 104 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 80 | 77 | 67 | 65 | 63 | 53 | 52 | 50 | 40 | 39 | 38 |
| 2   | 87  | 79  | 73  | 68  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 47 | 44 | 42 | 35 | 34 | 32 |
| 3   | 79  | 70  | 63  | 57  | 71 | 64 | 57 | 52 | 52 | 48 | 44 | 41 | 38 | 36 | 31 | 29 | 28 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 50 | 44 | 46 | 41 | 37 | 37 | 33 | 30 | 28 | 26 | 24 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 23 | 21 |
| 6   | 61  | 49  | 41  | 36  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 30 | 26 | 23 | 23 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 41 | 34 | 29 | 34 | 28 | 25 | 27 | 23 | 20 | 21 | 18 | 16 |
| 8   | 52  | 40  | 33  | 27  | 47 | 37 | 30 | 25 | 31 | 25 | 22 | 25 | 21 | 18 | 19 | 16 | 14 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 17 | 21 | 17 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4744 | 4744 | 4744 |
| 5°  | 4744 | 4668 | 4703 |
| 10° | 4697 | 4595 | 4633 |
| 15° | 4620 | 4509 | 4527 |
| 20° | 4518 | 4393 | 4418 |
| 25° | 4417 | 4258 | 4294 |
| 30° | 4292 | 4130 | 4138 |
| 35° | 4173 | 3982 | 3973 |
| 40° | 4028 | 3832 | 3816 |
| 45° | 3883 | 3681 | 3654 |
| 50° | 3724 | 3522 | 3468 |
| 55° | 3557 | 3338 | 3295 |
| 60° | 3368 | 3122 | 3097 |
| 65° | 3159 | 2896 | 2864 |
| 70° | 2896 | 2621 | 2611 |
| 75° | 2533 | 2290 | 2368 |
| 80° | 2092 | 1870 | 1924 |
| 85° | 1412 | 1181 | 1208 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3883 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 203.1   | 1.4       |
| 10°-20°   | 571.4   | 4.0       |
| 20°-30°   | 839.7   | 5.9       |
| 30°-40°   | 975.2   | 6.8       |
| 40°-50°   | 974.0   | 6.8       |
| 50°-60°   | 849.3   | 6.0       |
| 60°-70°   | 627.9   | 4.4       |
| 70°-80°   | 355.2   | 2.5       |
| 80°-90°   | 99.0    | 0.7       |
| 90°-100°  | 98.7    | 0.7       |
| 100°-110° | 368.1   | 2.6       |
| 110°-120° | 976.2   | 6.8       |
| 120°-130° | 1619.0  | 11.3      |
| 130°-140° | 1719.8  | 12.0      |
| 140°-150° | 1598.3  | 11.2      |
| 150°-160° | 1285.0  | 9.0       |
| 160°-170° | 828.0   | 5.8       |
| 170°-180° | 285.0   | 2.0       |
| 0°-30°    | 1614.1  | 11.3      |
| 0°-40°    | 2589.4  | 18.1      |
| 0°-60°    | 4412.7  | 30.9      |
| 0°-90°    | 5494.8  | 38.5      |
| 90°-120°  | 1442.9  | 10.1      |
| 90°-150°  | 6380.0  | 44.7      |
| 90°-180°  | 8778.0  | 61.5      |
| 0°-180°   | 14272.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2158 | 2158  | 2158 | 2158  | 2158 |      |
| 5°   | 2158 | 2150  | 2126 | 2143  | 2139 | 205  |
| 15°  | 2054 | 2042  | 2014 | 2023  | 2012 | 578  |
| 25°  | 1859 | 1842  | 1807 | 1811  | 1807 | 855  |
| 35°  | 1604 | 1583  | 1550 | 1537  | 1527 | 1001 |
| 45°  | 1305 | 1290  | 1259 | 1237  | 1228 | 1007 |
| 55°  | 988  | 975   | 950  | 925   | 915  | 883  |
| 65°  | 666  | 654   | 633  | 614   | 604  | 659  |
| 75°  | 348  | 344   | 334  | 322   | 326  | 372  |
| 85°  | 85   | 83    | 81   | 75    | 73   | 95   |
| 90°  | 2    | 26    | 43   | 54    | 58   | 13   |
| 95°  | 141  | 69    | 84   | 96    | 93   | 167  |
| 105° | 659  | 724   | 132  | 156   | 165  | 704  |
| 115° | 1246 | 1283  | 1337 | 334   | 178  | 1226 |
| 125° | 1761 | 1790  | 1831 | 1846  | 1852 | 1571 |
| 135° | 2180 | 2214  | 2234 | 2256  | 2251 | 1684 |
| 145° | 2528 | 2526  | 2563 | 2578  | 2567 | 1581 |
| 155° | 2784 | 2765  | 2791 | 2804  | 2786 | 1283 |
| 165° | 2934 | 2921  | 2927 | 2942  | 2927 | 829  |
| 175° | 3001 | 2985  | 2990 | 3005  | 2983 | 286  |
| 180° | 2994 | 2994  | 2994 | 2994  | 2994 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2157.6 | 2157.6 | 2157.6 | 2157.6 | 2157.6 |
| 2.5°   | 2170.1 | 2159.8 | 2136.9 | 2157.6 | 2153.7 |
| 5°     | 2157.6 | 2149.5 | 2126.5 | 2143.0 | 2139.2 |
| 7.5°   | 2143.0 | 2130.7 | 2107.9 | 2124.6 | 2120.4 |
| 10°    | 2120.4 | 2105.9 | 2081.0 | 2097.5 | 2091.4 |
| 12.5°  | 2089.1 | 2076.8 | 2052.0 | 2062.3 | 2058.1 |
| 15°    | 2053.9 | 2041.6 | 2014.5 | 2022.9 | 2012.5 |
| 17.5°  | 2010.3 | 1998.0 | 1970.9 | 1981.2 | 1970.9 |
| 20°    | 1962.6 | 1950.3 | 1921.2 | 1927.3 | 1919.2 |
| 22.5°  | 1915.0 | 1896.3 | 1869.2 | 1869.2 | 1865.0 |
| 25°    | 1858.9 | 1842.4 | 1807.1 | 1811.1 | 1807.1 |
| 27.5°  | 1796.6 | 1782.1 | 1755.2 | 1749.0 | 1738.7 |
| 30°    | 1734.5 | 1717.8 | 1686.8 | 1680.6 | 1672.3 |
| 32.5°  | 1668.0 | 1655.7 | 1622.5 | 1609.9 | 1601.6 |
| 35°    | 1603.7 | 1583.1 | 1549.8 | 1537.3 | 1527.0 |
| 37.5°  | 1531.1 | 1512.5 | 1479.2 | 1464.7 | 1454.3 |
| 40°    | 1456.6 | 1439.8 | 1406.5 | 1388.0 | 1379.7 |
| 42.5°  | 1383.9 | 1367.2 | 1334.1 | 1313.2 | 1300.9 |
| 45°    | 1305.1 | 1290.5 | 1259.3 | 1236.6 | 1228.2 |
| 47.5°  | 1228.2 | 1213.7 | 1180.5 | 1157.6 | 1145.3 |
| 50°    | 1147.3 | 1136.9 | 1107.9 | 1078.8 | 1068.4 |
| 52.5°  | 1068.4 | 1053.9 | 1027.0 | 1004.2 | 989.7  |
| 55°    | 987.7  | 975.1  | 950.2  | 925.3  | 915.0  |
| 57.5°  | 906.6  | 896.3  | 869.2  | 844.4  | 836.0  |
| 60°    | 825.7  | 817.6  | 788.5  | 765.5  | 759.4  |
| 62.5°  | 746.9  | 732.4  | 711.6  | 690.9  | 682.6  |
| 65°    | 666.1  | 653.5  | 632.8  | 614.2  | 603.7  |
| 67.5°  | 583.1  | 572.6  | 554.1  | 539.5  | 531.1  |
| 70°    | 506.3  | 497.9  | 479.2  | 464.7  | 456.6  |
| 72.5°  | 427.5  | 419.1  | 408.8  | 394.2  | 388.0  |
| 75°    | 348.4  | 344.5  | 333.9  | 321.6  | 325.8  |
| 77.5°  | 278.0  | 269.6  | 265.5  | 259.3  | 253.2  |
| 80°    | 207.6  | 205.4  | 201.2  | 195.1  | 190.9  |
| 82.5°  | 141.1  | 141.1  | 139.1  | 130.8  | 130.8  |
| 85°    | 84.9   | 83.0   | 81.0   | 74.6   | 72.6   |
| 87.5°  | 37.4   | 33.3   | 29.1   | 22.8   | 20.7   |
| 90°    | 2.1    | 26.0   | 43.3   | 54.2   | 58.4   |
| 92.5°  | 54.2   | 45.6   | 52.0   | 56.3   | 58.4   |
| 95°    | 140.7  | 69.2   | 84.4   | 95.5   | 93.2   |
| 97.5°  | 253.4  | 75.9   | 110.3  | 117.1  | 119.1  |
| 100°   | 383.6  | 86.7   | 123.5  | 140.7  | 145.1  |
| 102.5° | 526.4  | 522.2  | 127.9  | 151.5  | 158.3  |
| 105°   | 658.6  | 723.7  | 132.2  | 155.9  | 164.7  |
| 107.5° | 812.5  | 866.5  | 136.6  | 160.3  | 169.0  |
| 110°   | 960.0  | 1005.2 | 379.3  | 162.6  | 171.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1098.6 | 1137.4 | 1100.7 | 166.7  | 173.4  |
| 115°   | 1245.7 | 1282.6 | 1336.8 | 333.7  | 177.8  |
| 117.5° | 1373.6 | 1416.9 | 1453.9 | 1143.8 | 576.3  |
| 120°   | 1516.7 | 1549.1 | 1588.2 | 1614.1 | 1321.6 |
| 122.5° | 1637.8 | 1672.6 | 1716.1 | 1728.9 | 1731.3 |
| 125°   | 1761.3 | 1789.6 | 1830.7 | 1845.9 | 1852.4 |
| 127.5° | 1874.0 | 1904.4 | 1937.1 | 1958.6 | 1960.7 |
| 130°   | 1980.2 | 2014.9 | 2038.7 | 2062.6 | 2060.5 |
| 132.5° | 2088.6 | 2116.9 | 2140.6 | 2160.1 | 2158.0 |
| 135°   | 2179.6 | 2214.3 | 2233.6 | 2255.6 | 2251.2 |
| 137.5° | 2274.9 | 2300.8 | 2322.7 | 2344.3 | 2337.9 |
| 140°   | 2367.9 | 2385.5 | 2409.2 | 2428.7 | 2417.8 |
| 142.5° | 2446.2 | 2461.3 | 2489.4 | 2506.7 | 2495.8 |
| 145°   | 2528.5 | 2526.2 | 2563.0 | 2578.2 | 2567.3 |
| 147.5° | 2599.8 | 2593.4 | 2630.1 | 2641.0 | 2632.4 |
| 150°   | 2669.3 | 2654.1 | 2688.8 | 2701.6 | 2690.9 |
| 152.5° | 2727.7 | 2710.4 | 2742.8 | 2756.0 | 2740.8 |
| 155°   | 2784.0 | 2764.7 | 2790.7 | 2803.6 | 2786.4 |
| 157.5° | 2829.5 | 2812.3 | 2831.8 | 2847.0 | 2829.5 |
| 160°   | 2868.7 | 2855.6 | 2868.7 | 2881.5 | 2866.3 |
| 162.5° | 2903.1 | 2890.3 | 2901.0 | 2916.2 | 2896.7 |
| 165°   | 2933.5 | 2920.7 | 2927.1 | 2942.2 | 2927.1 |
| 167.5° | 2957.4 | 2944.3 | 2950.9 | 2966.1 | 2946.6 |
| 170°   | 2977.0 | 2963.8 | 2968.2 | 2983.4 | 2963.8 |
| 172.5° | 2989.9 | 2977.0 | 2981.3 | 2996.5 | 2977.0 |
| 175°   | 3000.6 | 2985.4 | 2989.9 | 3004.9 | 2983.4 |
| 177.5° | 3004.9 | 2989.9 | 2992.1 | 3007.3 | 2987.8 |
| 180°   | 2994.2 | 2994.2 | 2994.2 | 2994.2 | 2994.2 |

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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 | 11.40            | 12.17 | 12.45 | 13.22 | 14.65 | 10.96          | 11.72 | 12.01 | 12.78 | 14.20 |
|                 | 3H   | 13.03            | 13.72 | 14.09 | 14.78 | 16.23 | 12.54          | 13.23 | 13.60 | 14.29 | 15.74 |
|                 | 4H   | 13.60            | 14.26 | 14.67 | 15.32 | 16.77 | 13.11          | 13.76 | 14.18 | 14.83 | 16.28 |
|                 | 6H   | 13.98            | 14.58 | 15.06 | 15.65 | 17.12 | 13.48          | 14.08 | 14.56 | 15.15 | 16.62 |
|                 | 8H   | 14.08            | 14.65 | 15.16 | 15.73 | 17.19 | 13.58          | 14.15 | 14.66 | 15.23 | 16.69 |
|                 | 12H  | 14.12            | 14.66 | 15.21 | 15.74 | 17.22 | 13.61          | 14.15 | 14.70 | 15.23 | 16.71 |
| 4H              | 2H   | 11.84            | 12.49 | 12.92 | 13.55 | 15.01 | 11.48          | 12.13 | 12.56 | 13.20 | 14.65 |
|                 | 3H   | 13.67            | 14.22 | 14.76 | 15.31 | 16.77 | 13.26          | 13.81 | 14.35 | 14.90 | 16.37 |
|                 | 4H   | 14.37            | 14.87 | 15.46 | 15.95 | 17.43 | 13.94          | 14.44 | 15.03 | 15.52 | 17.01 |
|                 | 6H   | 14.86            | 15.29 | 15.96 | 16.39 | 17.87 | 14.43          | 14.85 | 15.53 | 15.96 | 17.44 |
|                 | 8H   | 15.00            | 15.40 | 16.10 | 16.49 | 17.99 | 14.56          | 14.96 | 15.66 | 16.06 | 17.55 |
|                 | 12H  | 15.06            | 15.42 | 16.17 | 16.53 | 18.03 | 14.61          | 14.97 | 15.72 | 16.08 | 17.58 |
| 8H              | 4H   | 14.54            | 14.94 | 15.64 | 16.04 | 17.54 | 14.17          | 14.57 | 15.27 | 15.66 | 17.16 |
|                 | 6H   | 15.15            | 15.48 | 16.27 | 16.62 | 18.11 | 14.76          | 15.09 | 15.88 | 16.23 | 17.73 |
|                 | 8H   | 15.35            | 15.64 | 16.48 | 16.77 | 18.28 | 14.96          | 15.25 | 16.09 | 16.37 | 17.88 |
|                 | 12H  | 15.47            | 15.72 | 16.60 | 16.84 | 18.39 | 15.06          | 15.31 | 16.19 | 16.43 | 17.98 |
| 12H             | 4H   | 14.52            | 14.89 | 15.64 | 16.00 | 17.50 | 14.15          | 14.52 | 15.27 | 15.63 | 17.13 |
|                 | 6H   | 15.17            | 15.46 | 16.30 | 16.58 | 18.10 | 14.80          | 15.09 | 15.93 | 16.21 | 17.72 |
|                 | 8H   | 15.39            | 15.65 | 16.53 | 16.77 | 18.32 | 15.01          | 15.27 | 16.14 | 16.39 | 17.93 |