

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: P909017

Luminaire Tested: DFN2DIP-SQ2F0-060D080US840-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909017  
REPORT IS A COMBINATION OF REPORTS P901357 AND P898215  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-060D080US840-FLLONL  
Description: 2 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

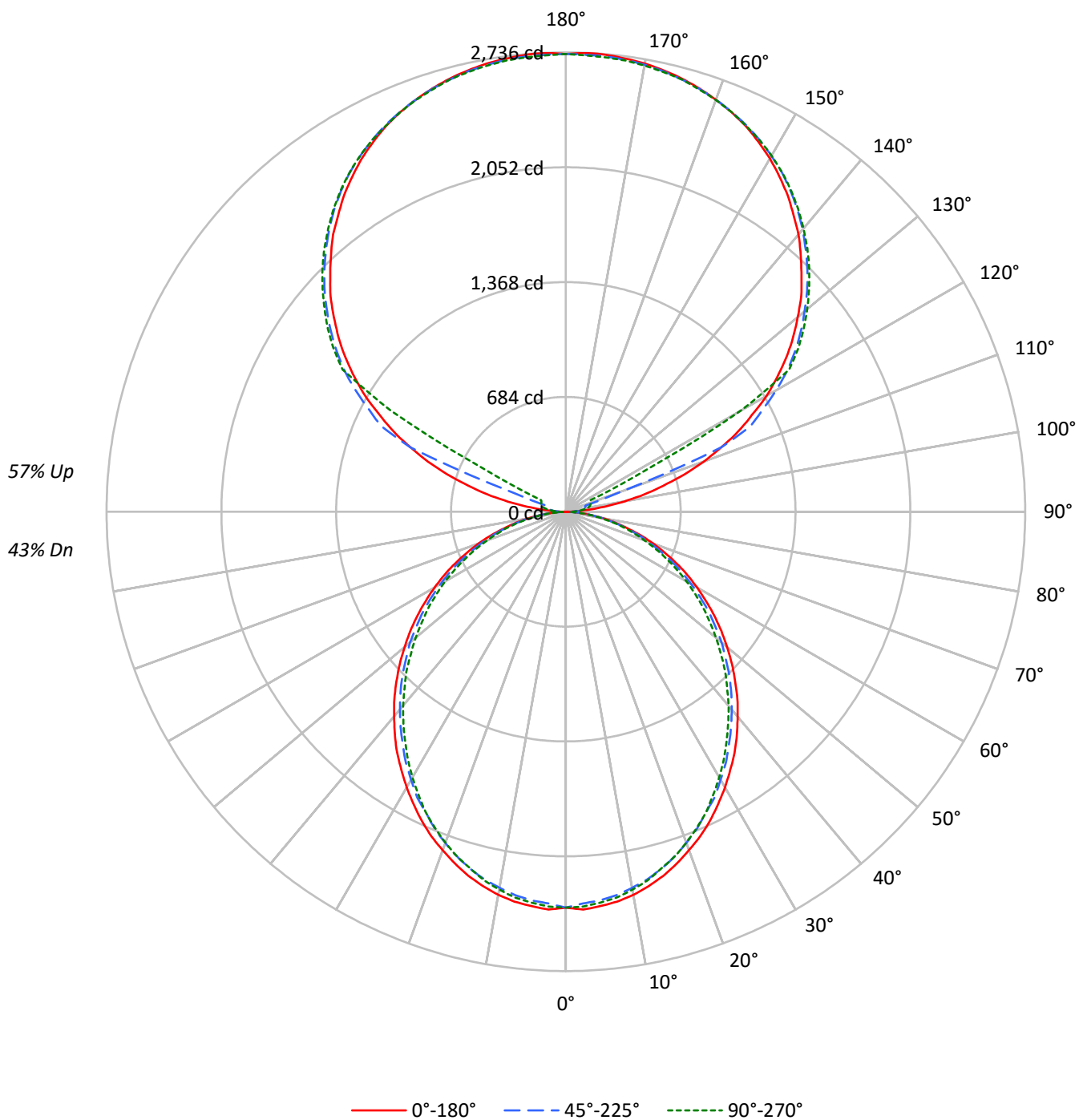
Lumens per Lamp: N/A  
Luminaire Lumens: 13996.7 lumens  
Efficiency: N/A  
Efficacy: 116.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 120  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 64 | 64 | 64 | 50 | 50 | 50 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 70 | 67 | 65 | 56 | 55 | 53 | 44 | 43 | 42 |
| 2   | 88  | 80  | 74  | 69  | 80 | 74 | 68 | 64 | 61 | 57 | 54 | 49 | 47 | 44 | 39 | 37 | 35 |
| 3   | 80  | 71  | 63  | 58  | 73 | 65 | 58 | 53 | 54 | 49 | 45 | 44 | 40 | 38 | 34 | 32 | 30 |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 31 | 28 | 26 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 37 | 33 | 35 | 31 | 28 | 28 | 25 | 23 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 25 | 22 | 20 |
| 7   | 57  | 45  | 37  | 32  | 52 | 41 | 34 | 29 | 35 | 29 | 25 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 26 | 23 | 26 | 22 | 19 | 21 | 18 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 5184 | 5184 | 5184 |
| 5°  | 5183 | 5101 | 5139 |
| 10° | 5133 | 5021 | 5062 |
| 15° | 5048 | 4927 | 4946 |
| 20° | 4937 | 4801 | 4828 |
| 25° | 4826 | 4652 | 4692 |
| 30° | 4690 | 4513 | 4522 |
| 35° | 4560 | 4351 | 4341 |
| 40° | 4401 | 4187 | 4169 |
| 45° | 4243 | 4022 | 3993 |
| 50° | 4069 | 3848 | 3790 |
| 55° | 3886 | 3648 | 3601 |
| 60° | 3680 | 3411 | 3384 |
| 65° | 3452 | 3165 | 3129 |
| 70° | 3164 | 2863 | 2853 |
| 75° | 2768 | 2503 | 2588 |
| 80° | 2286 | 2043 | 2102 |
| 85° | 1544 | 1290 | 1321 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4243 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 221.9   | 1.6       |
| 10°-20°   | 624.4   | 4.5       |
| 20°-30°   | 917.5   | 6.6       |
| 30°-40°   | 1065.7  | 7.6       |
| 40°-50°   | 1064.4  | 7.6       |
| 50°-60°   | 928.1   | 6.6       |
| 60°-70°   | 686.1   | 4.9       |
| 70°-80°   | 388.2   | 2.8       |
| 80°-90°   | 107.2   | 0.8       |
| 90°-100°  | 89.9    | 0.6       |
| 100°-110° | 335.1   | 2.4       |
| 110°-120° | 888.9   | 6.4       |
| 120°-130° | 1474.3  | 10.5      |
| 130°-140° | 1566.0  | 11.2      |
| 140°-150° | 1455.4  | 10.4      |
| 150°-160° | 1170.1  | 8.4       |
| 160°-170° | 754.0   | 5.4       |
| 170°-180° | 259.5   | 1.9       |
| 0°-30°    | 1763.8  | 12.6      |
| 0°-40°    | 2829.5  | 20.2      |
| 0°-60°    | 4821.9  | 34.5      |
| 0°-90°    | 6003.4  | 42.9      |
| 90°-120°  | 1314.0  | 9.4       |
| 90°-150°  | 5809.7  | 41.5      |
| 90°-180°  | 7993.0  | 57.1      |
| 0°-180°   | 13996.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2358 | 2358  | 2358 | 2358  | 2358 |      |
| 5°   | 2358 | 2349  | 2324 | 2342  | 2337 | 224  |
| 15°  | 2244 | 2231  | 2201 | 2210  | 2199 | 632  |
| 25°  | 2031 | 2013  | 1975 | 1979  | 1975 | 935  |
| 35°  | 1752 | 1730  | 1694 | 1680  | 1668 | 1094 |
| 45°  | 1426 | 1410  | 1376 | 1351  | 1342 | 1101 |
| 55°  | 1079 | 1066  | 1038 | 1011  | 1000 | 965  |
| 65°  | 728  | 714   | 692  | 671   | 660  | 720  |
| 75°  | 381  | 376   | 365  | 351   | 356  | 406  |
| 85°  | 93   | 91    | 88   | 82    | 79   | 104  |
| 90°  | 2    | 24    | 39   | 49    | 53   | 13   |
| 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 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2357.6 | 2357.6 | 2357.6 | 2357.6 | 2357.6 |
| 2.5°   | 2371.4 | 2360.1 | 2335.0 | 2357.6 | 2353.3 |
| 5°     | 2357.6 | 2348.7 | 2323.7 | 2341.8 | 2337.4 |
| 7.5°   | 2341.8 | 2328.3 | 2303.3 | 2321.6 | 2317.0 |
| 10°    | 2317.0 | 2301.2 | 2273.9 | 2292.0 | 2285.2 |
| 12.5°  | 2282.9 | 2269.4 | 2242.2 | 2253.5 | 2249.0 |
| 15°    | 2244.3 | 2230.9 | 2201.3 | 2210.5 | 2199.2 |
| 17.5°  | 2196.8 | 2183.3 | 2153.7 | 2164.9 | 2153.7 |
| 20°    | 2144.6 | 2131.1 | 2099.3 | 2106.1 | 2097.2 |
| 22.5°  | 2092.6 | 2072.1 | 2042.6 | 2042.6 | 2038.0 |
| 25°    | 2031.2 | 2013.3 | 1974.7 | 1979.0 | 1974.7 |
| 27.5°  | 1963.2 | 1947.3 | 1917.9 | 1911.3 | 1900.0 |
| 30°    | 1895.4 | 1877.0 | 1843.2 | 1836.4 | 1827.3 |
| 32.5°  | 1822.7 | 1809.3 | 1772.9 | 1759.2 | 1750.1 |
| 35°    | 1752.5 | 1729.9 | 1693.5 | 1679.8 | 1668.5 |
| 37.5°  | 1673.1 | 1652.6 | 1616.4 | 1600.4 | 1589.1 |
| 40°    | 1591.5 | 1573.3 | 1537.0 | 1516.8 | 1507.6 |
| 42.5°  | 1512.2 | 1493.9 | 1457.8 | 1435.0 | 1421.5 |
| 45°    | 1426.1 | 1410.2 | 1376.0 | 1351.3 | 1342.1 |
| 47.5°  | 1342.1 | 1326.3 | 1290.0 | 1265.0 | 1251.4 |
| 50°    | 1253.6 | 1242.3 | 1210.6 | 1178.8 | 1167.5 |
| 52.5°  | 1167.5 | 1151.7 | 1122.3 | 1097.3 | 1081.5 |
| 55°    | 1079.2 | 1065.5 | 1038.3 | 1011.2 | 999.9  |
| 57.5°  | 990.8  | 979.5  | 949.9  | 922.7  | 913.5  |
| 60°    | 902.2  | 893.3  | 861.6  | 836.6  | 829.8  |
| 62.5°  | 816.1  | 800.2  | 777.6  | 755.0  | 745.9  |
| 65°    | 727.8  | 714.2  | 691.6  | 671.1  | 659.7  |
| 67.5°  | 637.1  | 625.6  | 605.4  | 589.6  | 580.4  |
| 70°    | 553.2  | 544.1  | 523.6  | 507.8  | 498.9  |
| 72.5°  | 467.1  | 458.0  | 446.7  | 430.8  | 424.0  |
| 75°    | 380.7  | 376.5  | 364.9  | 351.4  | 356.0  |
| 77.5°  | 303.8  | 294.7  | 290.0  | 283.4  | 276.6  |
| 80°    | 226.8  | 224.4  | 219.8  | 213.1  | 208.5  |
| 82.5°  | 154.2  | 154.2  | 152.0  | 142.9  | 142.9  |
| 85°    | 92.8   | 90.7   | 88.5   | 81.5   | 79.4   |
| 87.5°  | 40.9   | 36.4   | 31.7   | 25.0   | 22.6   |
| 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  |

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**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 |

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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 | 12.18            | 12.98 | 13.20 | 14.01 | 15.38 | 11.74          | 12.54 | 12.75 | 13.56 | 14.93 |
|                 | 3H   | 13.82            | 14.53 | 14.84 | 15.57 | 16.96 | 13.33          | 14.04 | 14.35 | 15.08 | 16.47 |
|                 | 4H   | 14.39            | 15.07 | 15.43 | 16.10 | 17.50 | 13.89          | 14.57 | 14.93 | 15.61 | 17.01 |
|                 | 6H   | 14.77            | 15.40 | 15.82 | 16.44 | 17.85 | 14.27          | 14.90 | 15.32 | 15.94 | 17.35 |
|                 | 8H   | 14.87            | 15.46 | 15.92 | 16.52 | 17.92 | 14.36          | 14.96 | 15.42 | 16.02 | 17.42 |
|                 | 12H  | 14.90            | 15.47 | 15.96 | 16.52 | 17.95 | 14.40          | 14.96 | 15.45 | 16.01 | 17.44 |
| 4H              | 2H   | 12.62            | 13.30 | 13.67 | 14.34 | 15.74 | 12.27          | 12.95 | 13.31 | 13.98 | 15.38 |
|                 | 3H   | 14.46            | 15.03 | 15.51 | 16.09 | 17.50 | 14.05          | 14.62 | 15.11 | 15.68 | 17.09 |
|                 | 4H   | 15.16            | 15.68 | 16.22 | 16.73 | 18.16 | 14.73          | 15.25 | 15.79 | 16.31 | 17.74 |
|                 | 6H   | 15.65            | 16.10 | 16.72 | 17.18 | 18.60 | 15.22          | 15.66 | 16.29 | 16.74 | 18.17 |
|                 | 8H   | 15.79            | 16.21 | 16.86 | 17.28 | 18.72 | 15.35          | 15.77 | 16.42 | 16.84 | 18.28 |
|                 | 12H  | 15.85            | 16.23 | 16.94 | 17.31 | 18.76 | 15.40          | 15.78 | 16.49 | 16.86 | 18.31 |
| 8H              | 4H   | 15.34            | 15.75 | 16.41 | 16.83 | 18.27 | 14.96          | 15.38 | 16.03 | 16.45 | 17.89 |
|                 | 6H   | 15.94            | 16.29 | 17.03 | 17.40 | 18.84 | 15.56          | 15.90 | 16.65 | 17.01 | 18.45 |
|                 | 8H   | 16.15            | 16.45 | 17.25 | 17.55 | 19.01 | 15.75          | 16.06 | 16.85 | 17.15 | 18.61 |
|                 | 12H  | 16.26            | 16.53 | 17.37 | 17.62 | 19.12 | 15.85          | 16.12 | 16.96 | 17.21 | 18.71 |
| 12H             | 4H   | 15.32            | 15.69 | 16.40 | 16.78 | 18.23 | 14.95          | 15.32 | 16.03 | 16.41 | 17.86 |
|                 | 6H   | 15.97            | 16.27 | 17.06 | 17.37 | 18.82 | 15.59          | 15.90 | 16.69 | 16.99 | 18.45 |
|                 | 8H   | 16.19            | 16.46 | 17.29 | 17.55 | 19.05 | 15.81          | 16.07 | 16.91 | 17.17 | 18.66 |